

CIO

BUSINESS TECHNOLOGY LEADERSHIP

ON-DEMAND CRM

Where hosted solutions work, where they don't and how to tell the difference

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THE CRACKS IN PHARMA'S SUPPLY CHAIN

Can IT help stop the smuggling, counterfeiting and gray marketeering?

BY SUSANNAH PATTON

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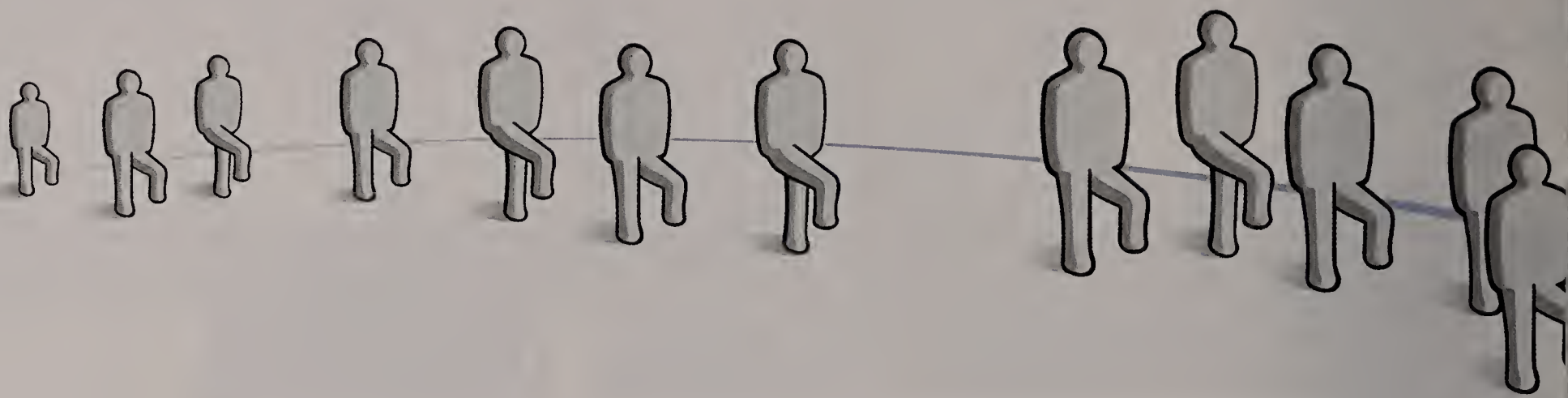
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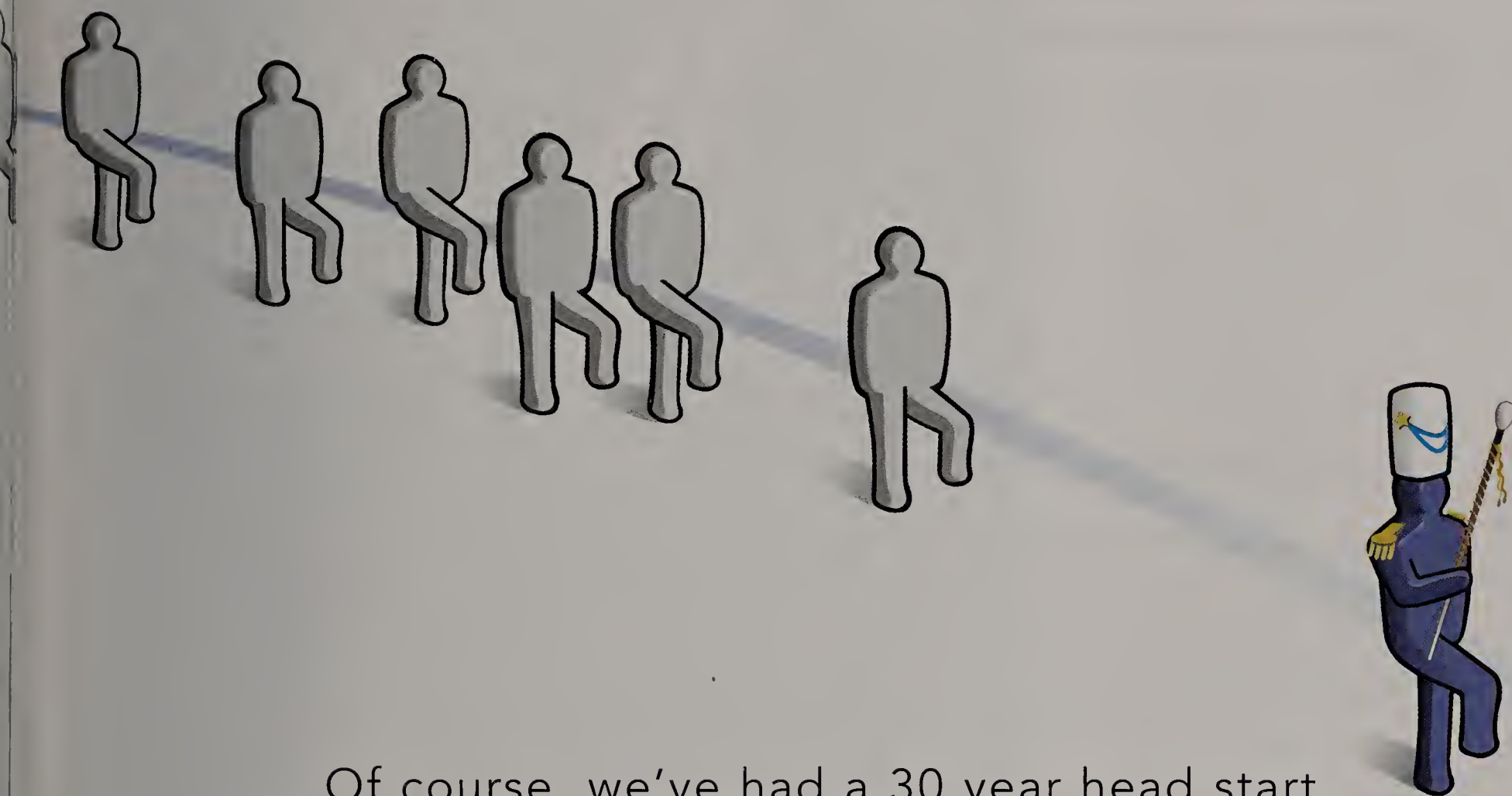
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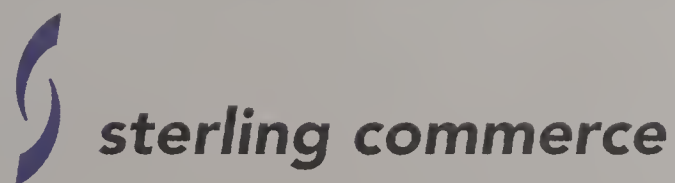
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Mike Celantano (left), Purdue Pharma's associate director of supply chain systems, and CSO **Aaron Graham** have begun tagging cases containing Oxycontin with RFID chips.

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The oldest baby boomers are six years away from retirement. Will your company continue to thrive if they take their knowledge with them? Here's how to identify who has key knowledge and how to keep it within the company walls.

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OCCASIONALLY, EVERYONE (or everyone's staff) needs a refresher on the basics. We've recently updated these fundamentals:

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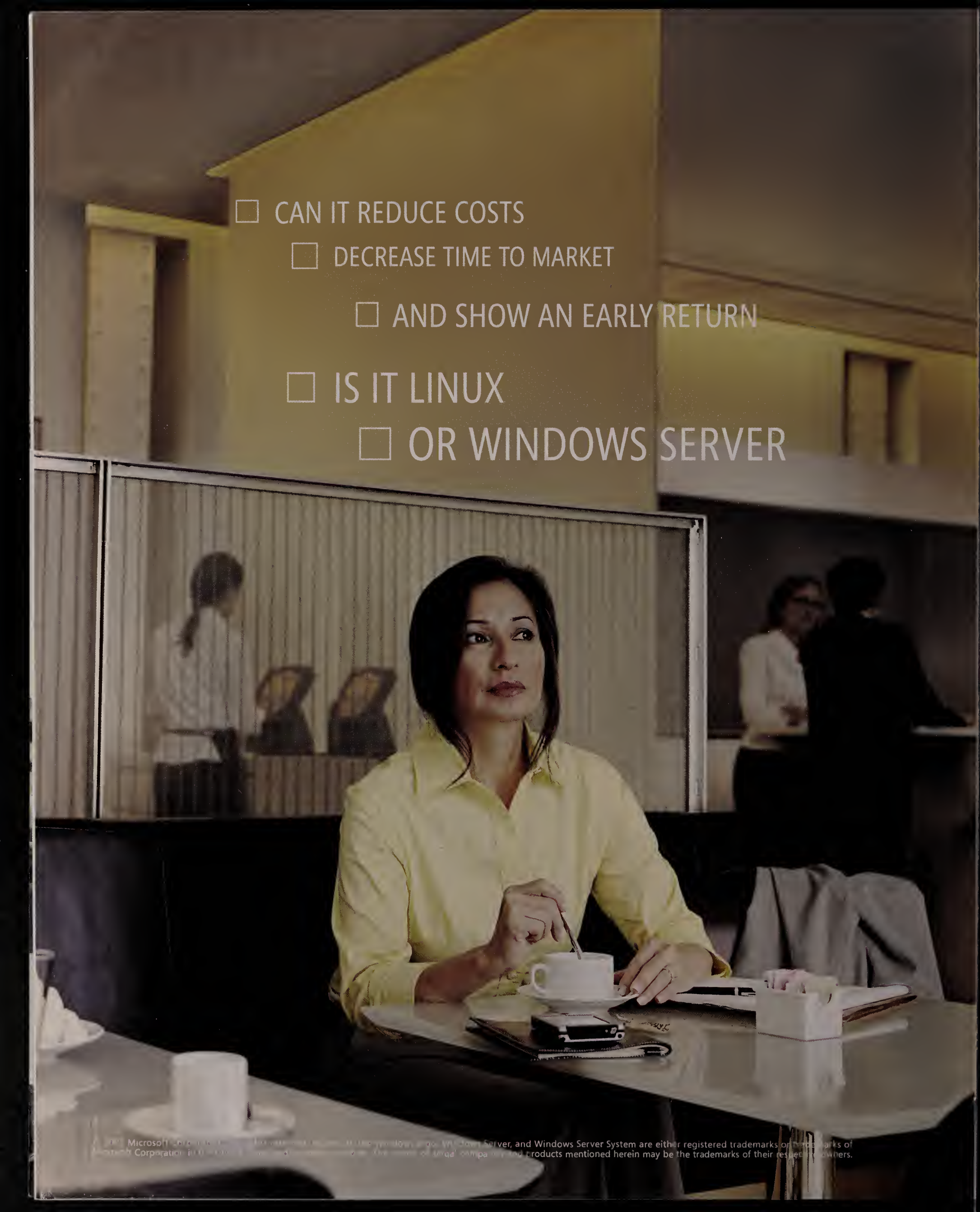
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You'll Miss Us When We're Gone

The approaching wave of baby boomer retirement is causing consternation in the business world. As well it should.

The other day, I told my 13-year-old son to take those damn thingies out of his ears, put away the iPod and pay attention. When he did, grudgingly, I suggested that we go buy his mom some bling for her birthday.

He skewered me with a censorious eye.

"Don't say that," he mumbled.

"What? I can't hear you when you mumble."

"Don't say bling."

"Isn't that a cool word?" I asked.

"Not when you say it," he mumbled.

The boy thought he was putting me in my place, but what he doesn't understand is that I'm a baby boomer; therefore, by definition, everything I do or say is cool.

And furthermore, I know everything about everything.

I know that pop music peaked with Sly and the Family Stone.

I know that Levi's and Wranglers are the only real jeans; everything else is ersatz.

I know that phones should ring, not play the opening bars of "Bohemian Rhapsody."

And in my business, journalism, I know that you should be able to sing a good headline to the tune of "Camptown Races," that there are exactly four kinds of leads, that editors should never let writers see them sweat, and that short words and paragraphs are better than long ones.

The question is, when I retire to Galaxy O' Golf, who at *CIO* will possess all this incredibly valuable knowledge? As obnoxious and spoiled as we boomers are, we

actually do know something about running things. We should. We've been running just about everything—including the country—for decades. (Of course, many young folk think we've done a rotten job. But who cares what they think? They're kids. What do they know?)

Boomers, like the dinosaurs we increasingly resemble, must eventually exit the stage to make room for new performers. But if the new guys don't want to see their show close quickly (and to bad reviews), they'd better figure out how to get the knowledge out of our heads and into theirs. Or at least into their databases. This is the subject of our knowledge management story on Page 60, "Beating the Boomer Brain Drain Blues" (doo-dah, doo-dah), by Senior Writer Susannah Patton. Right now, according to a recent AARP study, more than 60 percent of U.S. companies are bringing back retirees as contractors or consultants. Because they can't run their businesses without them. Because they didn't think (or know how) to capture their knowledge before they walked out the door.

Just imagine your old boss coming back to tell you what to do and how to do it.

A nightmare, yes?

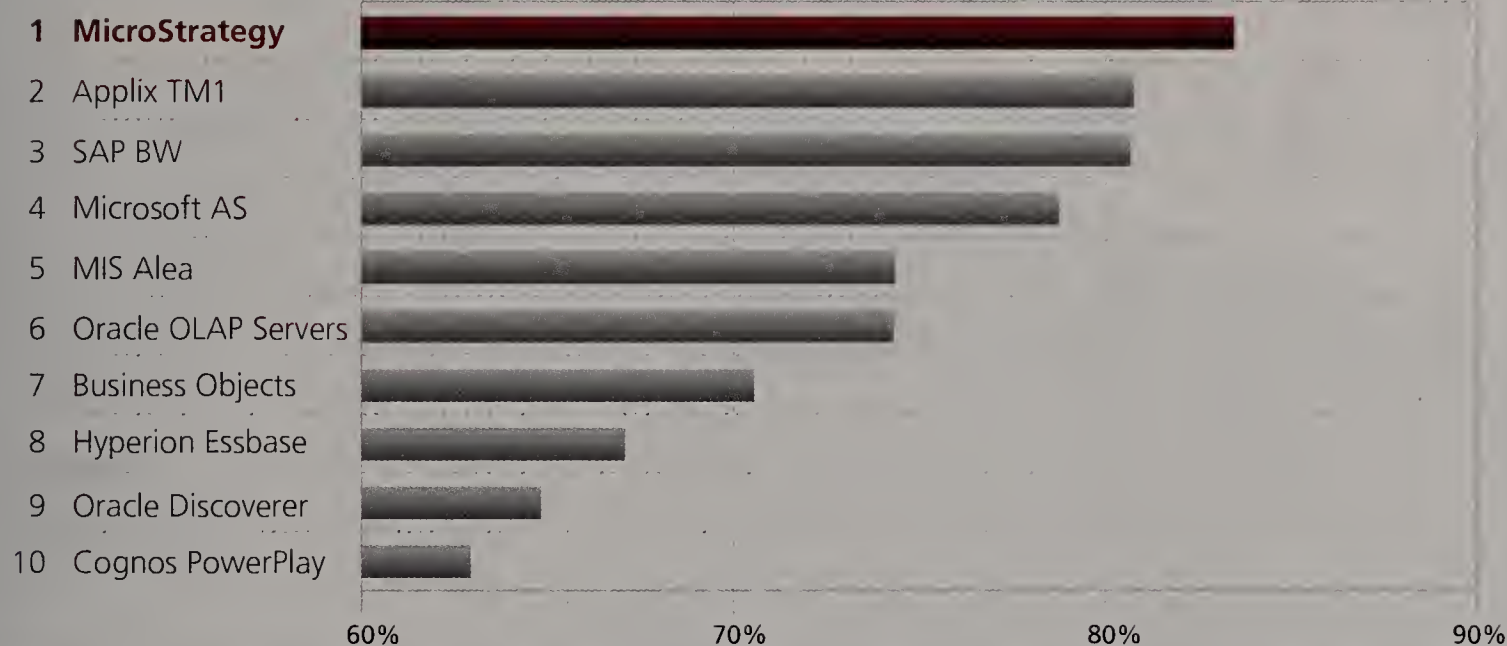
Better hop on that KM train right now. Or do you think that the knowledge we boomers possess is already antiquated and liable to become even more irrelevant as time goes by? You're wrong, of course, but if you want to argue about it, drop me a line.

David Rosenbaum, Managing Editor
drosenbaum@cio.com

PHOTO BY STEVEN VOTE

MicroStrategy is #1 in Customer Loyalty in the Business Intelligence Market

In a recent industry survey that measured customer loyalty, MicroStrategy outscored all of the competition.



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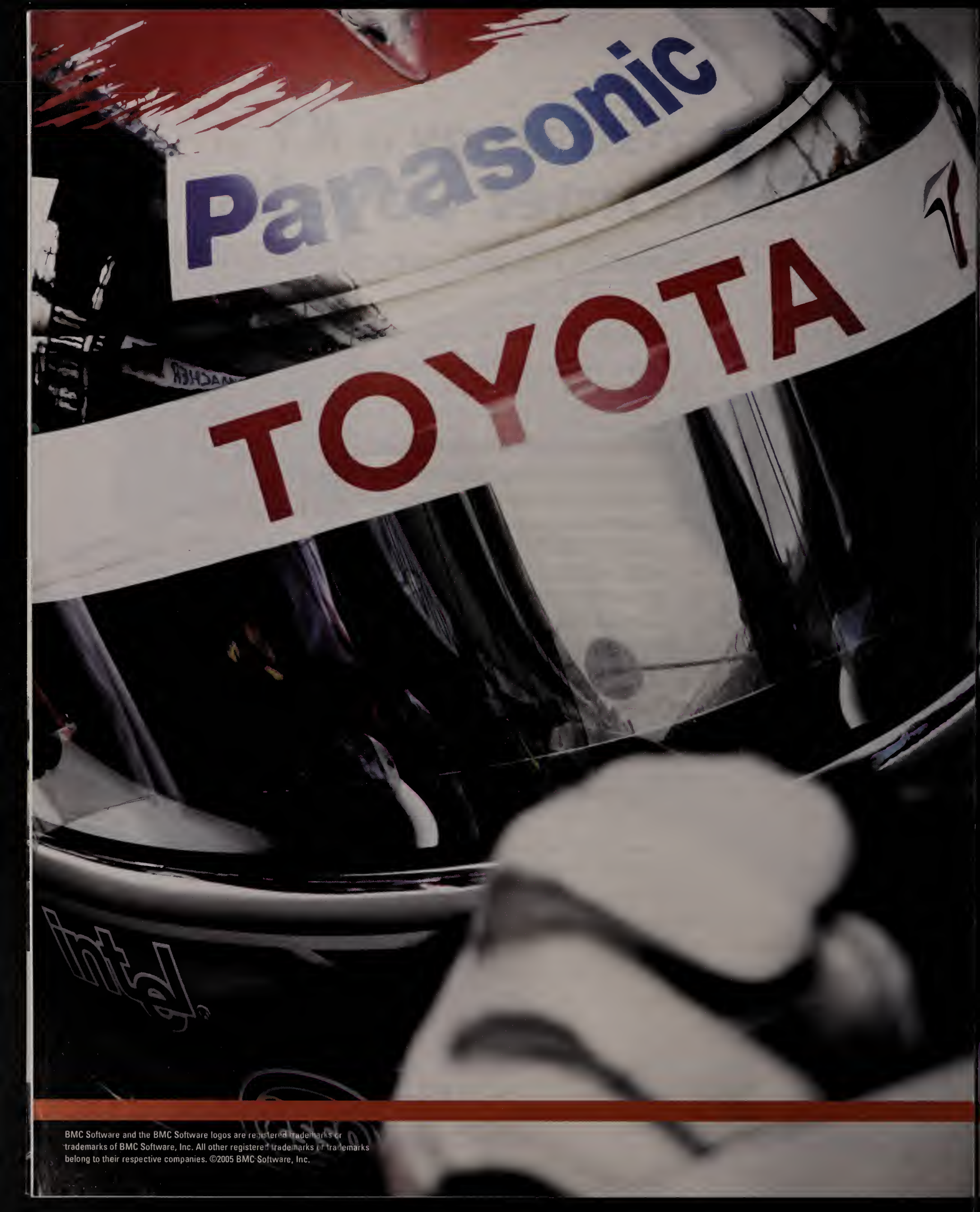
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Do Vendors Deliver?

CIOs want fewer—and better—vendor partners



Over the past few years it's become obvious that IT organizations want to partner with fewer vendors while reaping greater strategic value from those relationships. According to a recent IDC survey of IT and line-of-business executives, almost 60 percent plan to consolidate their partnerships. As this consolidation occurs, IT vendors have been quick to devise "road map" visions of how their products can provide a suite solution for their users and prospects. I'm sure you can rattle them off: CA's EITM (Enterprise IT Management), Mercury's BTO

(Business Technology Optimization), EMC's ILM (Information Lifecycle Management), SAS's EIP (Enterprise Intelligence Platform) and Symantec's Information Integrity. These platforms are all intended to be easy to use while reducing complexity and creating superior levels of speed, security and intelligence within the organization.

These are ideal goals. But what I want to know is: Are the vendors delivering? In *CIO*'s most recent "State of the CIO" research (which you can find by going to www.cio.com/state), your answer was, well, pretty mixed: 54 percent of you said yes, meaning that 46 percent of you were not satisfied with the relationship. How can this still be? Are the vendors promising too much, or are you failing to communicate to them exactly what you need?

The truth probably lies somewhere in the middle, but we live in a world where the customer is always right. So be it perception or reality, 46 percent of the user community is screaming that the IT vendor community is not delivering on its value proposition.

This is appalling, and vendors need to wake up. A reckoning is around the corner. The user community, pressed by the demands of driving revenue, profits and customer affinity, will no longer accept the status quo. IT vendors need to deliver on the promise of ELAV—Enterprise Leadership and Value.

Bottom line: It's high time for the partnership between vendor and user to become more beneficial to both. If you have that kind of relationship with your vendor, and you have that kind of ELAV platform, please let me know.

P.S. Here's hoping you had a happy and healthy New Year, and please don't worry about Gary Beach. He'll be back in the next issue. He has been gracious enough to share this space with me, and our columns will alternate in every other issue.

Michael Friedenberg, President and CEO
mfriedenberg@cio.com

PHOTO BY CHRISTOPHER HARTING



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PRESIDENT AND CEO Michael Friedenberg
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SENIOR WRITERS

Meridith Levinson,
Susannah Patton, Ben Worthen

STAFF WRITER

Thomas Wailgum

CONTRIBUTORS

Giuseppe De Filippo, Alice Dragoon,
Grant Gross, Asiff Hirji, Chris Ip, Rich Kogut,
Juan Carlos Pérez, Larry Ponemon

EDITORIAL ADMINISTRATOR

Jill Paquette

DESIGN

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EDITORIAL INTERN

Christopher Lynch

ONLINE EDITORIAL

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Meridith Levinson, mlevinson@cio.com

Stephanie Overby, soverby@cio.com

Edward Prewitt, eprewitt@cio.com

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- Budget Management & IT Value
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Edward Prewitt, eprewitt@cio.com

Elana Varon, evaron@cio.com

Christopher Koch, ckoch@cio.com

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Stephanie Overby, soverby@cio.com

Meridith Levinson, mlevinson@cio.com

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- Compliance

Ben Worthen, bworthen@cio.com

Allan Holmes, aholmes@cio.com

Susannah Patton, spatton@cio.com

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- Middleware
- Enterprise Resource Management (ERP)
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Christopher Koch, ckoch@cio.com

Ben Worthen, bworthen@cio.com

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Tom Wailgum, twailgum@cio.com

Susannah Patton, spatton@cio.com

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- Emerging Technology
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Chris Lindquist, clindquist@cio.com

Tom Wailgum, twailgum@cio.com

HEALTH CARE

Alison Bass, abass@cio.com

GOVERNMENT

Allan Holmes, aholmes@cio.com

COLUMN & DEPARTMENT CONTACTS

Applied Insight

Christopher Koch, ckoch@cio.com

Book Reviews

Elana Varon, evaron@cio.com

By the Numbers

Lorraine Cosgrove Ware, lcogrove@cio.com

Endlines

Alison Bass, abass@cio.com

Essential Technology

Christopher Lindquist, clindquist@cio.com

Forum

Cheryl Asselin, casselin@cio.com

From the Editor

Abbie Lundberg, lundberg@cio.com

From the Publisher

Gary Beach, gbeach@cio.com

InBox

Cheryl Asselin, casselin@cio.com

Keynote

Alison Bass, abass@cio.com

Martha Heller

Edward Prewitt, eprewitt@cio.com

Michael Schrage

Alison Bass, abass@cio.com

On the Move

Meridith Levinson, mlevinson@cio.com

Peer to Peer

Alison Bass, abass@cio.com

Susan Cramm

Edward Prewitt, eprewitt@cio.com

Total Leadership

Elana Varon, evaron@cio.com

Trendlines

Elana Varon, evaron@cio.com

Washington Watch

Allan Holmes, aholmes@cio.com

Ben Worthen, bworthen@cio.com

E-MAIL letters@cio.com **PHONE** 508 872-0080 **FAX** 508 879-7784 **ADDRESS** CIO Magazine, CXO Media Inc.,
492 Old Connecticut Path, P.O. Box 9208, Framingham, MA 01701-9208 **WEBSITE** www.cio.com

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Innovation: Practice Makes Perfect

Michael Schrage's Oct. 15 article, "The Key to Innovation: Overcoming Resistance," points to what should be part of the foundation of any IT organization: people skills. Those of us in the technology field are known for our intelligence and innovative ideas. However, when it comes to effectively communicating with the business side, we are sometimes a bit lacking.

In my experience, a major component of resistance to change is fear of the unknown. To a business manager, most of IT is unknown.

What I have found effective in overcoming obstacles to change (again, mainly the fear of the unknown) is the ability to remove myself from the IT space and put myself into the business space. In other words, when forming a presentation to convince the business side, I put myself in business management's shoes.

Now, while this is easy to say on paper, it takes a good amount of practice to get it right.

LIONEL F. LARATTE
Manager of Business Services
Primavera Systems
lionel.laratte@gmail.com

Schrage is on target in recognizing that the biggest obstacle to IT innovation is not lack of ideas, but rather overcoming

the resistance that snags effective implementation.

Although the most frequent cause of IT project failure is inadequate executive support, my experience has been that the problem lies at the bottom, not the top. Technologists are mired in territoriality, political alliances and fear of the unknown. Set in their ways to the detriment of the organization, their resistance to change fuels implementation failures.

In regard to "We can't do that because..." the key resistance indicator noted by Schrage, I have found that same underlying mentality more frequently (and politically) expressed as "We can definitely do that" in a pleasant and helpful tone, soon followed by an extensive set of terms and conditions impossible to live with, including other projects that will not get done, systems that "might as well be" completely rewritten, marginally related improvements, and requests piggybacked on and bundled in because it makes sense to do them together. The result: impossibly slow, barely discernible progress gained at significant pain and expense to the organization.

The solution to this deadly inertia is, sadly, consultants—vigilantly and effectively managed by business-focused, IT-knowledgeable managers. Why are business users constantly clamoring for consultants, or worse, asking to bring in their own consultants? Because enthusiastic, motivated, open-minded implementation teams are required for IT project success. This comes with a price that the business is often willing to pay.

IT needs to think long and hard about the solution to sluggish implementation, lest we outsource our steady jobs into permanent oblivion.

ANONYMOUS

What Do You Think?

Send your thoughts and feedback to letters@cio.com. Letters may be edited for length or clarity. For a link to the articles mentioned, go to www.cio.com/011506.

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A close-up portrait of Jim Bakke, a man with dark hair, wearing a suit and tie, looking slightly to the side with a subtle smile.

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trendlines

EDITED BY ELANA VARON

NEW * HOT * UNEXPECTED



THE FAST LANE FOR SPEEDING TICKETS

HANDHELD COMPUTERS If you get pulled over for speeding in Los Angeles, you won't have to cool your heels for too long waiting for your ticket. Early this year, the Los Angeles Police Department is scheduled to roll out a system for issuing speeding citations electronically from handheld devices.

The system aims to reduce the time-consuming and error-prone process of writing and processing paper tickets. It works like this:

Officers retrieve the identification data encoded on the magnetic strip of a driver's license by swiping the card on their handheld. The driver's information pops up, and the officer toggles through several screens to fill out the citation. The offender signs the citation on the handheld, much like people do for package delivery. Officers can then print the citation (which looks like a car-rental company's receipt) on the spot via a wireless printer.

The officers upload wirelessly all of the citations they have issued for the day at the end of their shifts. The data is transmitted daily to Los Angeles's municipal court system for processing and billing, thereby automating a manual process.

LAPD CIO Tim Riley says the e-citation system builds on a multimillion-dollar investment the city made several years ago, following the Rampart police corruption scandal in the 1990s. One of the worst police scandals in U.S. history, it resulted in a 2001 consent decree with the U.S. Department of Justice, whereby federal officials would monitor all of the LAPD's interactions with the public.

Continued on Page 24

Getting Trucks to the Right Place at the Right Time

CUSTOMER SERVICE A new year, and time to get rid of all that useless stuff—like the plaid couch you've had since grad school. But when you call 1-800-GOT-JUNK to take it away, you forget to specify that you live on Maple Avenue, not Maple Street—on the other side of the city.

Luckily for your blood pressure and 1-800-GOT-JUNK's bottom line, address verification software by QAS validates your address against postal

records and catches the error as your job is scheduled. Since deploying the software last April, the company has saved around \$86,000.

"We used to have a significant amount of incorrect data, probably around 10 percent," says Roman Azbel, vice president of IT at the company. Because it took too much phone time for sales agents to verify addresses directly with customers, customer service agents later had to

double-check each address to ensure they sent drivers to the correct house.

Now the company provides more accurate routing instructions to its drivers and has reduced the time it takes to process a single order to two to three minutes. And, says Azbel, "We're able to place 3 percent more jobs on a single truck because we're not wasting time going to addresses that don't exist." —Alice Dragoon

Matthew Meier, an IT manager at GM, touted his company's cars in a recent commercial.



He Puts the "IT" in Celebrity

MARKETING The only time you're likely to see IS people in TV ads is when big consultancies want viewers to think their in-house IS needs help. And the actors in those ads are portraying stereotypical, IS geeks with little business sense.

Cut to Matthew Meier, a manager of IT management and planning within General Motors' IT Strategy Group. Meier was featured in a GM commercial that ran this past fall and winter, including during ABC's *Monday Night Football* telecasts. Meier has two lines, in which he tells viewers about the value of GMC trucks and how easy it is to buy a vehicle from the company.

Meier isn't sure how he ended up in the ad. "I got on somebody's list," he recalls. "Then I was told to bring some khakis and a blue shirt, and go to someone's house in Birmingham, Mich."

He says he was amazed by all the planning that went into filming a 30-second TV spot (including decisions about what he should wear and where he should stand). "We obviously must spend a lot on advertising," he says of the process.

Back at the IS shop, Meier has been dubbed "Hollywood" by his colleagues. Seeing himself on TV is surreal, he says. "You just don't believe it's you."

—Thomas Wailgum

LAPD E-tickets

Continued from Page 23

The department's 9,300 officers had to fill out a paper form every time they had contact with a person. Sometimes officers answered the questions incorrectly, and forms were lost or misfiled.

So in 2003, the LAPD rolled out 1,200 Symbol Technologies handheld devices to capture all of the required data electronically. The department, along with vendor CalAmp, wrote software that could guide officers through any encounter, whether a traffic stop or an interview on the street. Officers answer questions about the encounters by checking boxes on the handheld screen. A central database records data from some 2,500 interactions each day.

Using the handhelds has reduced the time it takes to capture information to less than a minute and has eliminated nearly all of the reporting errors, so officers don't have to redo their reports. Riley expects similar results for the e-citation program, which is a separate application. Adding the ticket-writing capability to the handhelds that officers were already using cost \$1.3 million. It was a no-brainer, Riley says. "We're maximizing the investment the city made."

The department protects its data in part by allowing officers to connect to the secure police network only when they are near the short-range wireless access points on police buildings.

There's more to come. Riley says the department plans to add more applications to the handheld in the future, so that officers can retrieve information from police databases at the touch of a button. "A lot of thought went into [the handheld strategy]," Riley says, "and we intend to continue to grow it."

—Thomas Wailgum



Enter CIO's Best Administrative Assistant Contest

KUDOS What makes a good executive or administrative assistant? Outstanding organizational skills? Judgment and ferocity as a gatekeeper? A knack for anticipating and solving problems? CIO wants to recognize the best administrative assistant in honor of Administrative Professionals Day on April 26. If your assistant is tops, tell us why.

The rules: CIOs must do the nominating and can nominate only their own administrative or executive assistant. Write an e-mail no longer than 150 words telling us why your assistant should be recognized as the best of the best. (Be sure to include an anecdote to make your case.) Send the e-mail with "admin contest" in the subject line to Elana Varon, Trendlines editor, at evaron@cio.com by Jan 31. Please include your telephone number for confirmation.

CIO editors will choose a winner and write about that person in our April 15 issue. The honoree will also receive a bouquet of flowers from the boss and CIO.

OPERATIONAL BI: BUILDING THE FUTURE

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POWERING DATA ANALYTICS

AS BUSINESSES INCREASINGLY stake their survival on the ability to manipulate and analyze data, the importance of operational business intelligence has skyrocketed. Operational BI, which embeds analytical processes within the operational business structure to trigger real-time decision making and collaboration, is fundamentally changing how data is used, where it exists and how it is accessed.

This change is rapidly exposing the limitations of traditional analytical tools. Most traditional databases and data warehouses don't take into consideration the increasing use of unstructured data stored outside these systems. Moreover, data used for operational analysis is frequently accessed before coming to the data warehouse, such as RFID data coming from a store or warehouse being used at a number of points before being sent to a data warehouse. That trend will continue with the soaring growth of self-service technologies, a trend that demands split-second return times on queries that are increasingly integrated into the business process.

As operational BI spreads, CIOs and IT managers face a dilemma: They must enable new strategies for how their companies use information, or risk a significant competitive disadvantage. But how do you ensure success as you move from operational BI theory to reality? The following tactics are key to the successful implementation of this promising new technology.

Choose service-oriented tools and products. Operational BI depends on a company's ability to collect and analyze information midstream—such as a point-of-sale cashier accessing a

customer profile to offer tailored promotions—before sending it to core systems, regardless of who owns the master data store. “The ability to get a glimpse of the entire pipeline in and outside of the company is very valuable to the agility of a corporation,” says Chris Thomas of Intel Corporation. A new generation of service-oriented BI tools that can collect feeds mid-tier and then send the results of this analysis along to core systems helps companies respond quickly and effectively to changing market conditions. Products such as Sybase IQ and Avaki, for example, are built to respond to operational BI requirements.

Build a foundation of service-oriented architecture. Service-oriented architecture that lets users access real-time knowledge with a set of service feeds can maximize business agility while reducing complexity. For example, SOA flexibly and cost-effectively supports the midstream, on-the-fly data collection and analysis necessary for operational BI. Service orientation also supports operational BI throughout the business by pushing BI data out to the mobile workforce and enabling workers across the enterprise to incorporate this vital data into their workflow. The hardware foundation for SOA should include robust, open standards-based 64-bit platforms such as HP servers powered by the Intel® Itanium® 2 processor.

Consider Enterprise Information Integration. EII, as evidenced in solutions such as Avaki, federates data sources to provide a single view for end users and is a good choice for customers with information coming from dozens of sources and users who need to make decisions on the fly. For example, the new straight-through processing requirements in the financial services industry will drive institutions to perform immediate risk analysis and increase the need for operational BI.

VALUE ACROSS THE ENTERPRISE

Operational BI proves a smart investment from both the business and technology perspectives. By taking the guesswork out of operational decision making, companies can tie decisions directly to pertinent business information and make decisions on the fly throughout the enterprise. Imagine sales reps sending and receiving real-time order and refill data via mobile devices, and ware-

FOR MORE ON operational BI and the data explosion, go to: <http://domains.cio.com/dataexplosion2>.

house workers using that data to reroute deliveries en route. Or consider the value to financial workers using real-time data to do immediate risk analysis. Those decisions can be based on information pulled from a wide variety of data, and that data will be available regardless of location, as mobile workers use operational BI information from a variety of devices. Operational BI solutions from Sybase running on HP servers with the Itanium 2 processor should scale to the ever-increasing user population that needs to access analytical data at the production level.

On the technology front, “CIOs should expect faster query speeds and faster data loading as their operational BI solutions take advantage of performance boosters such as a 64-bit architecture and analytics algorithms that have been optimized for the Itanium 2 processor,” says Thomas. They should find infrastructure management easier and more cost-effective as a partitioned, virtualized environment allows for flexibility in meeting peak demands, along with better management of hardware and server growth. With a solution based on Sybase IQ, HP servers and the Itanium 2 processor, storage and hardware investments should lessen long term—Sybase IQ requires less storage and hardware than traditional database environments, and powerful Intel Itanium 2-based servers from HP can support rising workloads and offer capabilities to support virtualization and enhance manageability.

In the final analysis, taking the time to understand the opportunities and challenges from both business and technology perspectives should pay big dividends in business value down the road. “Define pain points in business value terms,” says Joseph Shaffner at Sybase. “By applying analytic solutions at the operational point of pain itself, companies can derive immediate business advantages. This is the promise of operational business intelligence.”

ACTION ITEMS

Tactical Tips

CIOs who have pulled the trigger on an operational BI implementation are the point people for the big decisions, as well as the chief liaisons for business-IT process discussions. Key task points include the following:

Strategic decision making. While the ultimate approval rests with those who approve the budget, CIOs are responsible for making the case for the project. With operational BI, they need to collaborate with business executives to identify the areas within a business that can be improved by

operational decision making. Hot spots include frontline jobs where personnel need to access information immediately and from disparate sources to make real-time decisions. From there, executives must map those business and analytical decision-making processes to an operational BI implementation and work with project sponsors to assemble a business case that is based on hard costs and detailed analysis of the payback cycle of operational BI. Final step: shepherding the project through the approval process at the executive board level.

Budgetary impact. A significant segment of building a business case for operational BI is doing cost analysis, and evaluating

the project within the overall portfolio of IT investments. How will projected savings from an operational BI implementation—for example, within projected storage needs—offset technology purchase and payback? How will the increased performance from an operational BI implementation result in faster ROI? CIOs must also assess their current data infrastructure to adapt it for operational BI, investing in service-oriented technologies and BI tools that let users quickly access data from a wide variety of mobile and desktop devices. Training resources are also a factor, as both users and IT staff will need to stretch their skills to implement and use this new analytical model.



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WHO USES GOOGLE?

TRENDLINES

ONLINE ADVERTISING Google users tend to be richer and have more Internet experience than those who primarily use competing search services from Microsoft, Yahoo and others, according to a new study.

A survey of 1,000 Internet users in the United States by S.G. Cowen & Co. found that the longer people have been using the Internet, the more likely it is that Google will be their search engine of choice. These frequent Google users are more likely than people who use competing search engines to have household incomes above \$60,000. Google is also the most popular search engine: 52 percent of respondents chose it as their primary site for general Web searches.

The study finds that among the search engines, Google is the current leader in paid search, a rapidly growing form of online advertising. "The study

The Wealthy Use Google

A higher percentage of Google users have incomes greater than \$60,000 than users of competing search engines.

Google	43%
MSN	35%
Yahoo	33%
AOL	32%

SOURCE: S.G. Cowen

crystallizes a view that's already out there: that Google is doing better because it is a more attractive site for advertisers, says Jim Friedland, S.G. Cowen director and senior research analyst. "On the demographic issue, advertisers will look to advertise to higher-income customers."

—Juan Carlos Pérez

washingtonwatch

EDITED BY ALLAN HOLMES

A Challenge to VoIP Wiretaps

Appeals court to weigh surveillance versus privacy

A federal appeals court should decide this year whether the FBI should have the right to wiretap Internet phone conversations.

In August 2004, the Federal Communications Commission ordered VoIP providers to make it possible for law enforcement agencies to tap the digital calls by 2007. The ruling enforces provisions of the Communications Assistance for Law Enforcement Act, a 1994 law that expanded the obligations of telecom carriers to assist law enforcement with electronic surveillance.

The U.S. Department of Justice argued to the FCC that CALEA for VoIP is necessary to "protect America from terrorists and criminals," according to a November 2004 DOJ letter to the FCC. The number of VoIP lines in use totals in the tens of millions, according to the largest telecommunication companies.

But last October, telecom trade group CompTel and VoIP provider Pulver.com, along with three privacy advocacy groups, asked the U.S. Court of Appeals for the District of Columbia Circuit to overturn the FCC ruling. They argued that allowing VoIP calls to be wiretapped would introduce security vulnerabilities for customers. For example, unauthorized people could illegally listen to private conversations and steal information, the groups argued. "What the FCC rule does is say, 'Build surveillance technology into Internet protocol,'"

says Susan Landau, a distinguished engineer at Sun Microsystems. "We feel that's very dangerous and weakens national security rather than strengthens it."

Creating a way to tap VoIP calls is untenable for companies such as Magellan Health Services, a provider of mental health services based in Avon, Conn. The company operates an internal VoIP system that doesn't connect to the public phone network, but if the company decides to connect its system outside the company, its conversations would be open to wiretaps. "Since we deal with extremely confidential information concerning people's mental health issues, we would not support anyone outside Magellan tapping into those conversations," says Bob Odenheimer, head of IT operations and telecommunications at Magellan.

The potential for personal information being leaked raises liability issues, too, warns Kevin Kalinich, co-national managing director of the technology and professional risks group at Aon Corp. Aon consults with large companies on insurance packages and risk management programs. Many Aon customers are worried about exposing themselves to privacy complaints, he says. "The voice over IP systems don't have all the technological capabilities to comply with these regulations," Kalinich says.

—Grant Gross

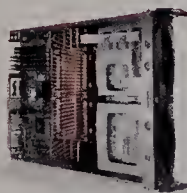
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Financial Intelligence: A Manager's Guide to Knowing What the Numbers Really Mean

By Karen Berman and Joe Knight, with John Case
Harvard Business School Press, 2006, \$24.95

Get to Know the Numbers

Understanding corporate financial statements makes you a better decision-maker

TRENDLINES

BOOK REVIEW Creating corporate financial statements is an art, and it's one that every manager (or anyone who aspires to be one) should be able to converse about intelligently. Karen Berman and Joe Knight have written *Financial Intelligence: A Manager's Guide to Knowing What the Numbers Really Mean* to teach us how.

Their most important lesson is that financial numbers—whether

for revenue or expenditures, profits or losses—are subjective. Accountants who craft financial statements make assumptions that determine how revenue and expenses are accrued and allocated.

Managers who make decisions based on the data that accountants present to them often lack any understanding of these biases, and thus accept whatever they are given at face

value. But when you know where the numbers come from, Berman and Knight argue, and you understand the factors that have influenced them, you're able to challenge them when warranted. The authors offer Enron as an extreme example of the role managers fail to play in keeping numbers honest.

On a daily basis, however, understanding finance can also help you make more effective requests for things your department needs and help you suggest ways your company can improve its performance.

Berman and Knight, co-own-

ers of the Business Literacy Institute in Los Angeles, provide a concise tutorial, explaining the basics about income statements, balance sheets and cash-flow statements. They illustrate key concepts by showing how you can apply them: how to put together a capital expenditure proposal, for example.

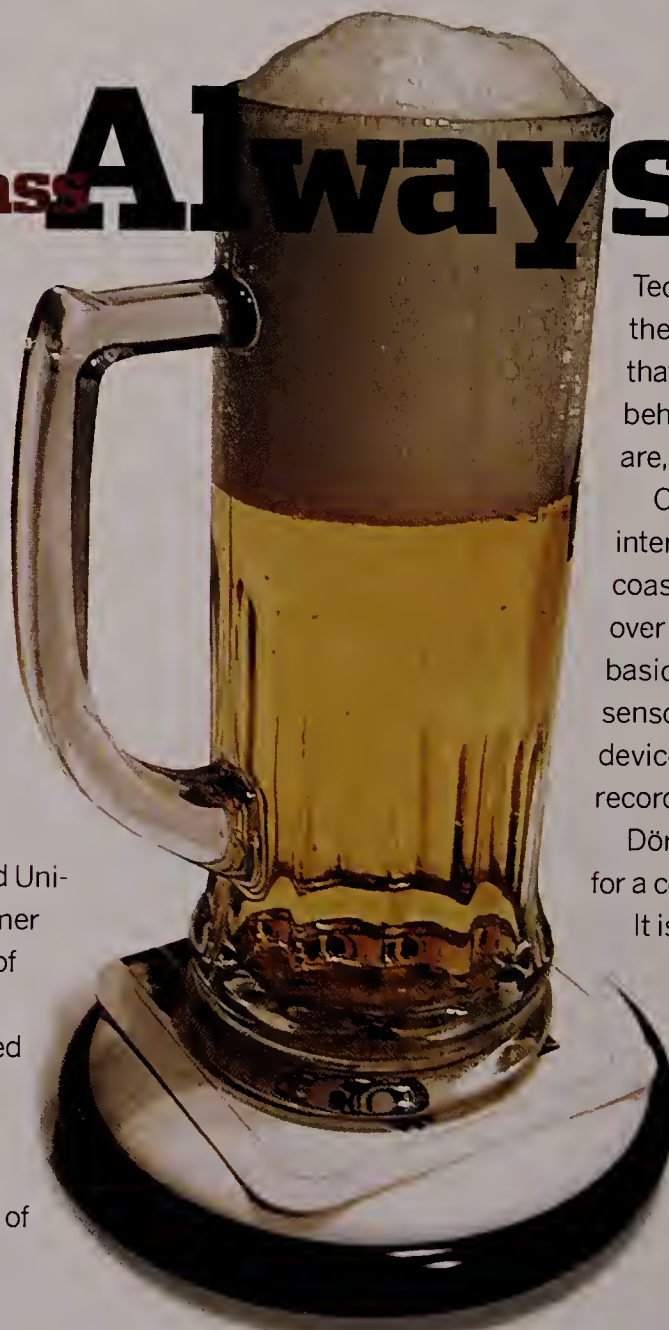
When you have the knowledge and skills to ask questions, you will make more informed decisions about your business. Everyone in a company reaps the benefits of that.

—Katherine Walsh

Here's to Your Glass Always Being Full

SENSORS It's Sunday afternoon at your favorite watering hole, and there are five minutes left in the fourth quarter. Your team's up by a touchdown—which you missed while waiting in line for the restroom. Now your beer glass is empty, and it looks like it's going to be a while before the waiter makes it back your way. Do you take your chances at the crowded bar, where you can't see the screen, or do you watch the final minutes sans libations? If Robert Dörr has his way, you won't have to choose: A sensor-equipped coaster will ensure your drink is refilled before you can say, "Super Bowl XL."

Dörr, a computer-science student at Saarland University in Germany, and Matthias Hahnen, a former product design student at Saarbrücken School of Arts, have created a coaster-like device that can alert bartenders when their patrons' glasses need refills. The devices are embedded with sensors, which can record the weight of a glass placed on top of them. Radio transmission units called Smart-Its, created by the Swiss Federal Institute of



Technology, read measurements collected by the sensors and send them to a basestation that's connected to a host computer. "A terminal behind the bar shows where the empty glasses are," Dörr says, and alerts the bartender.

Other applications for the technology include interactive voting (lift an empty glass from the coaster and return it to vote yes; turn the coaster over to vote no), and teaching beginners the basics of dancing or gymnastics (because the sensors measure gravity as well as weight, the device can be attached to a person's clothing to record and analyze their movements).

Dörr and Hahnen conceived the smart coaster for a cooperative class offered by their two schools.

It is made of plastic foam. Ordinary coasters that provide advertising and absorb moisture can be secured on top of the device.

To date, the duo has received a number of inquiries from vendors that want to license and produce the device, but they haven't accepted any offers.

—Al Sacco



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by the numbers

BY LARRY PONEMON

The Value of Protecting Customer Privacy

Companies can maintain consumers' trust—and keep their business—by safeguarding personal data

Research by the Ponemon Institute finds that public trust in corporations is fragile. In a recent survey, more than 70 percent of respondents said that two data breaches in the same company would be sufficient grounds for them to take their business elsewhere. Another study, which examined consumers' opinions about the trustworthiness of 14 companies that suffered data security breaches this year, found that trust in these companies dropped significantly after the breaches were reported.

Obviously, companies must be sensitive to the impact a security breach can have on their reputation. The cost to a company of losing customers combined with the difficulty of recruiting new ones after a data breach averages \$75 for every customer record it loses. The news isn't all bad, however. Most individuals will share a large amount of personal information if they trust a company.

During the past three years, the institute has surveyed more than 31,700 consumers about the degree to which they trust the way companies in different industries collect and use their personal information.

Respondents were asked to consider how a variety of privacy practices contributed to a company's trustworthiness, as well as the overall dependability of the company's products and services. Slightly more than two-thirds of consumers said privacy practices are related to a company's trustworthiness, although information practices (including privacy) were somewhat less important than a company's dependability and pricing practices.

The institute also surveyed 129 large companies about their privacy practices. Those that consumers said were the most trustworthy tended to have specific privacy practices in place, a way for customers to file complaints or get help resolving privacy issues, a privacy policy that is easy to understand and limits sharing of personal information.

That means it's up to companies to establish responsible information practices that protect personal data and take into account individuals' privacy preferences.

—Larry Ponemon is founder and chairman of the Ponemon Institute, an ethics and privacy think tank. He can be reached at larry@ponemon.org.

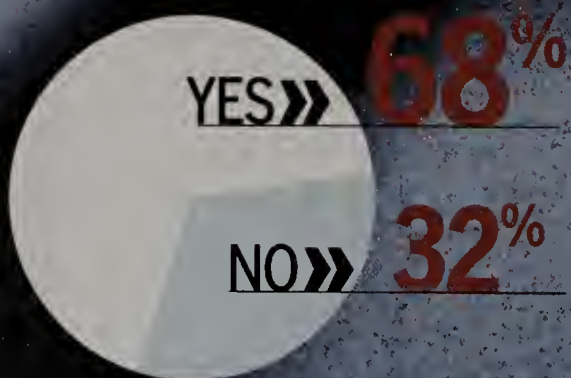
Best Practices

1] Keep information private and secure. Ensure that customer information is protected from unauthorized access and use. Have contingency plans in place for protecting that information in the event of a disruption of business or a catastrophic event.

2] Collect only the information you need, and make sure it's accurate. Collect only what's necessary for doing business. Companies should review the data they do collect for accuracy on an ongoing basis.

3] Be consistent. Use the same rules and procedures for collecting, retaining and managing confidential information throughout the enterprise.

Is privacy related to trust?



Key Privacy Practices

The most trusted companies are more likely than the least trusted companies to have:

1. A process for resolving privacy complaints
2. An easy-to-understand policy
3. Limits on data sharing
4. An opt-in (and out) policy for data sharing
5. A branding strategy that includes privacy

Ranked by customers in order of importance
SOURCE: Ponemon Institute

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Shopping for a Future

CIOs soon will be able to pick their career paths according to their strengths as leaders and whether they want to focus on technology or business



Recently I participated in a panel at a financial services technology conference. During the question and answer period, a senior partner from one of those high-dollar strategic consulting firms had the temerity to ask me how quickly I thought the role of CIO would disappear.

This gentleman is a friend and former colleague and was himself a successful CIO. He and I have been discussing this very question for a number of years now. But there, in front of dozens of current and aspiring CIOs, I had to admit that I believe the role as we know it would disappear at many companies—and in the not-too-distant future.

Perhaps you're skeptical, but hear me out: Change in the CIO role is already upon us, and I would argue that it's a natural evolution. Although technology will always have an integral role in business—we've become dependent on it—we'll see a segmentation of CIO duties. In many instances, the CIO will continue as an operations leader, delivering services to the business units of an organization. However, in time we'll see more CIOs evolving into strategic leaders, driving and enabling business strategy.

This evolution will be good for all of us because we'll have the opportunity to make the best use of our strengths as leaders, whether as operations experts or strategists.

Two Visions of IT Leadership

Which type of leader a CIO becomes depends on how critical technology is to a company's operations. A useful way to think about this is to use a measure that I call "IT Intensity." IT intensity is a company's IT expense as a percentage of total operating expenses. In firms with high IT Intensity, it may be said that

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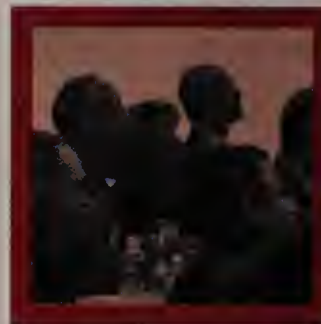
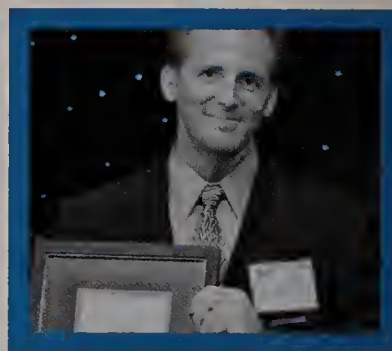
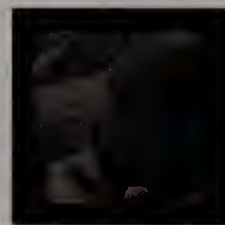
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technology is part and parcel of the business and that it is difficult to separate the two. An example would be my company, Ameritrade. Technology is paramount in everything we produce, from the tools our clients use online to the back-end technology that routes their orders to the stock markets. At the other end of the spectrum are low-IT intensity companies, such as retailers or hospitality companies, for which other factors, such as efficiency or client service, are more critical for achieving business goals.

At low-IT intensity companies, the CIO will become a manager of relationships with outsourcers. For such companies—where IT is not a core function—efficiency, availability and cost are likely to be the primary drivers of IT decisions, and these companies will be better off having someone else deliver IT.

Last year, a global bank did away with the corporate CIO role entirely after the incumbent CIO successfully outsourced most of the IT functions. The company needs flexible cost structures that can accommodate changes in business needs. The only part of the traditional IT organization that remains is a small application development function, the responsibilities of which include the creation of quantitative models for the trading and risk management groups. Those tasks were folded into the business lines, with technology supporting deployment through an operations leader.

In this type of environment, IT isn't glamorous; there will be

pressure to get things done with fewer resources, and innovation will not necessarily be the top priority. Therefore, the successful CIO will have to be good at motivating and retaining in-house staff. In addition, because the IT department is in the role of providing services to the business, the CIO at a low-IT intensity company must be a good facilitator with excellent communication and organizational skills.

At the other end of the spectrum we have high-IT intensity companies, where technology is a core business function. Within these companies, the CIO will take on a broader role in defining and executing the strategy of the company. A driver of IT decisions at such companies is likely to be whether IT fosters business innovation or creates products. In this environment, the IT leader is a key business leader.

My role as Ameritrade's CIO (before I became COO in August) was to create a high-performance, innovative culture within the IT organization. This role required me to develop a comprehensive understanding of all key business functions, the strengths, weaknesses, opportunities and threats affecting each, and how this information related to the company's strategy. CIOs who develop such knowledge have the opportunity to offer strategic insight to their business peers, which in turn enables them to participate in strategy development.

CIOs at high-IT intensity companies *Continued on Page 44*

He keeps changing the color on me. First it's red.
Then he wants blue. The guy's like a chameleon.

Good thing we got a
Ricoh color printer.



Leaks in the Great Wall

There is growing interest in outsourcing software development to China, but some CIOs worry about protecting their intellectual property in a country where software theft is perceived to be widespread. Is that perception accurate?



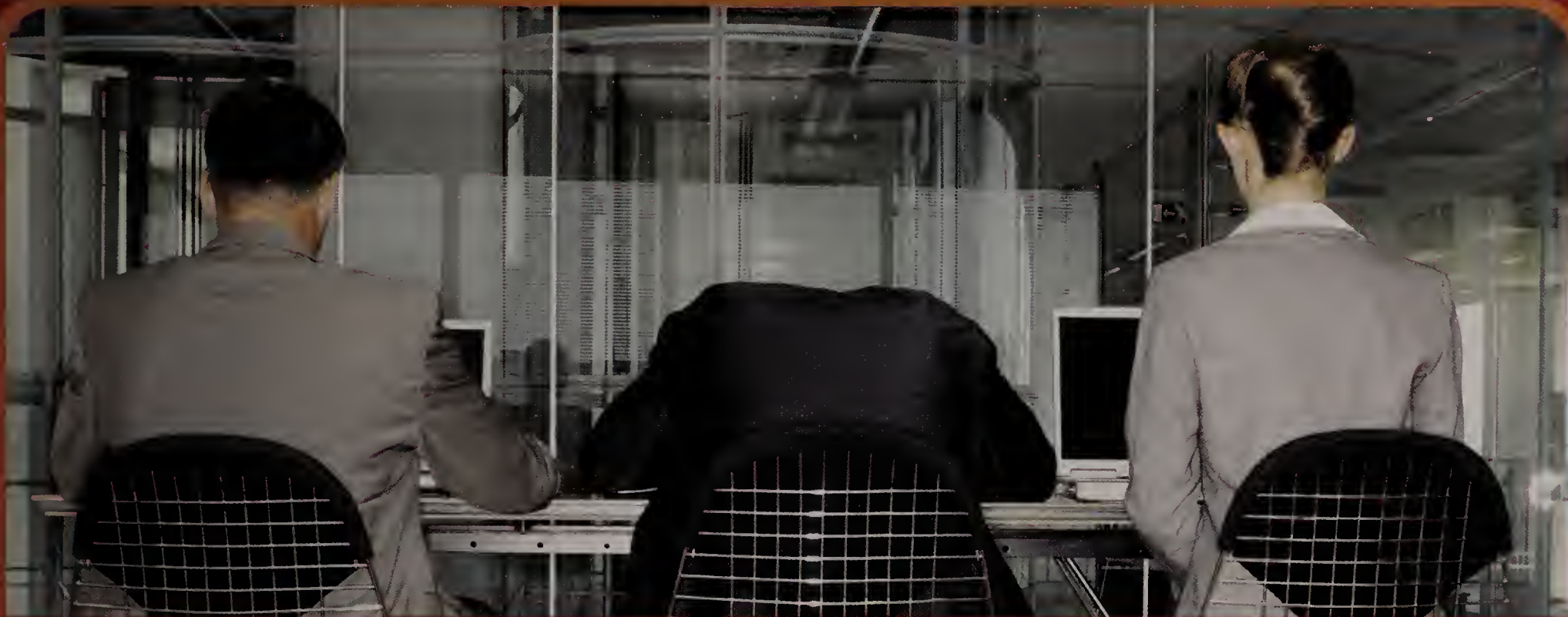
An increasing number of software companies as well as CIOs from a variety of industries are looking to China to outsource some of their software development. Good experiences in India have made the prospect of going far offshore more palatable. And as prices in India and other markets rise, cost-conscious CIOs are looking for even less-expensive alternatives.

If done properly, outsourcing to China can be a great opportunity. Chinese development is considerably less expensive than in most other places now being used. And China's capabilities are growing rapidly, thanks to increasing economic development and improving technology education.

But there is one big red flag that gets raised when U.S. executives talk about sending work to China—weak intellectual property (IP) protection. A recent survey by China's Ministry of Information Industry found that 61 percent of foreign companies operating in China see software piracy as the number-one problem of doing business there. Indeed, the IP issue may be why the Chinese outsourcing industry is facing fragmentation and low market share. In 2004, China captured only \$700 million (U.S.) of the global IT outsourcing market, valued at \$198 billion, and there are virtually no outsourcing players there with more than a few thousand employees. Multinational companies based in the United States, European Union or Japan fear that disreputable service providers could resell their software under a different name or even sell the code to competitors.

However, while there has been a high rate of theft of personal productivity and entertainment software at the consumer level (software that usually ships in a few CDs and does not require customization or expert knowledge for installation),

In network security there are two kinds of companies.
(Those that have enough and those that find out they don't.)



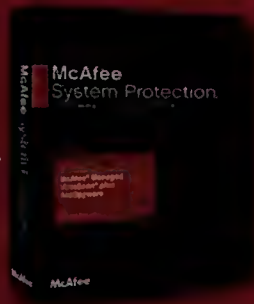
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there are few, if any, documented cases of IP being stolen or compromised when a Chinese development company was involved. The low theft rate of Chinese-developed software is due in part to the fact that most of the software work now done in China is for the Japanese market, which splits the source-code development across many vendors so that no one vendor has access to the complete code.

In reality, software developed for corporations is difficult to copy because it invariably is tailored to specific business requirements and so is not easily replicable, and it's likely to require expertise to install. The China head of a leading ERP software company confirmed that the company does not face issues with piracy in China because its software "does not come shrink-wrapped in a CD, and you cannot just press 'install' to install it." Its software requires complex configuration, and companies can't derive business benefits until such configuration happens.

The perception that China is an unsafe place to develop code may be based on the fact that China's enforcement of IP rights lags behind its enactment of IP laws. Historically, there has been little consequence to the domestic use of pirated software, especially if developed by foreign companies and used for personal use. In the recent McKinsey China Software Industry Survey, which surveyed the top 100 software companies in China, 60 percent of the executives interviewed were sympathetic toward local customers' propensity to use pirated software developed by foreign companies. China tends to deal more harshly with stolen software sold to foreign entities than with software sold domestically. The laws themselves are not as clear-cut as those in the United States. An attorney from a leading IP law firm in China said that "laws to protect software copyright resemble those in Europe....There is a gray area as to what constitutes 'significant' resemblance—hence, copyright infringement—of two products."

The risks can be mitigated if companies follow some basic guidelines to manage the development environment, educate and manage the staff, and pursue breaches and illegal users. Companies that are outsourcing (or offshoring) successfully in China set and enforce standards in these three areas:

The Development Environment

It's important to choose service providers that enforce physical protection. With proper safeguards, employees have no way of copying code or sending it outside the workplace. For example, one multinational with a development center in Hangzhou uses diskless computers on a closed network with no external connection and no printers. Access to the center is strictly controlled, and programmers may only download or upload data or code from the central server under strict supervision.

Key measures:

- Use computers with no USB or disk drives and no external network connection to prevent copying.

- Split the project into different pieces and different locations, so that no single employee has the complete code base.
- Use biometric and fingerprinting techniques to track who is doing what.
- Use a strict code-tracing technique to monitor copying.

Staff Education and Training

Successful companies proactively educate their staff about the legal aspects of IP, and they manage those issues on an ongoing basis. For the CEO of a 120-person company, "IP issues are central to the corporate culture and are reinforced by ongoing workshops and training."

Key activities:

- Enforce IP protection in employment contracts, for example, through tough penalties.
- Have employees leave their personal effects in a locker room, then go to the computer room to work.
- Educate employees on IP rights and create an IP-focused environment.

Legal Enforcement

It's important to know that your outsourcing provider will aggressively pursue breaches and users. Choose companies with assets in the United States or Europe, where your legal agreement can be easily enforced and is legally binding for both partners.

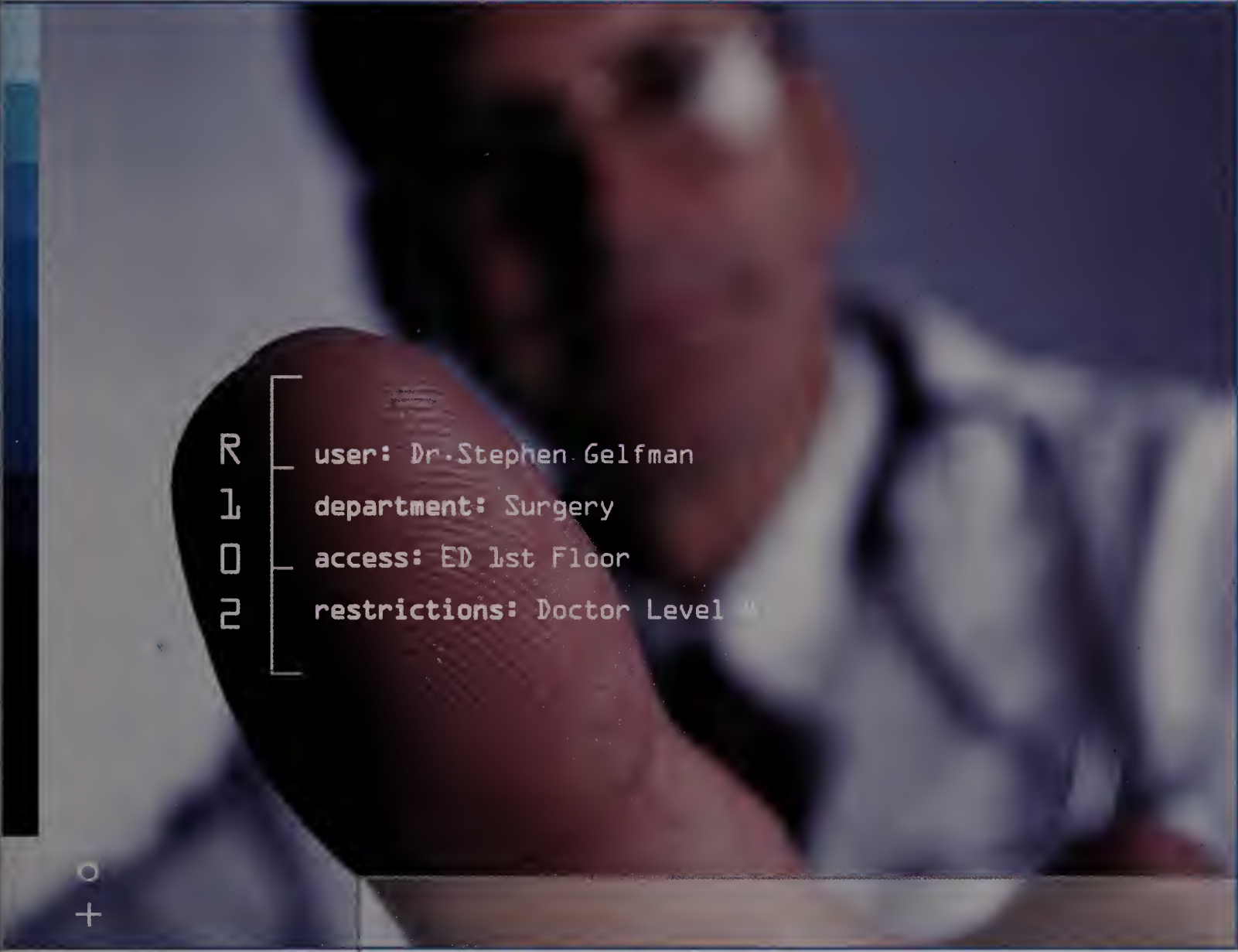
Key measures:

- Use a nondisclosure agreement and related contract regulated under U.S. or E.U. jurisdiction.
- Prioritize companies with U.S. or E.U. operations so you can sue their U.S. or E.U. subsidiaries under overseas law.
- Require that all employees and subcontractors sign a nondisclosure agreement as part of their employment contract.
- Hire detectives to identify users of illegal copies and approach top management with your evidence.
- Maintain and publish lists of culprits and breaches.

Despite the perception that software piracy in China is rampant, there are few cases where foreign companies have been harmed by outsourcing to China. That's because many foreign companies have managed to effectively deal with piracy and the leading outsourcing companies in China by adopting these measures. Multinational companies planning to outsource will soon face a shortage of skilled resources in the traditional outsourcing countries and must consider how to leverage the engineering talent pool that China offers. **CIO**

Giuseppe De Filippo is an associate principal with McKinsey's Shanghai office, and Chris Ip is a principal in the Hong Kong office. Send comments or questions to Abbie Lundberg at lundberg@cio.com.





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The Vision Thing

The first thing this CIO of a brand-new university had to do was lay out his vision for getting IT up and running. Then, it was a race against time—and the inevitable glitches.

BY RICH KOGUT



On Sept. 6, 2005, the University of California, Merced campus, opened its doors with 875 students, on its way to becoming a full-sized UC campus of about 25,000. The challenge of building a 21st century research university from scratch was daunting. Buildings needed to be built, faculty hired, curriculum developed, students recruited, and an entire organizational and governance model defined and staffed. I had joined this adventure about three years earlier in August 2002 as CIO, with the mission of deploying all things IT and telecommunications.

At the time, California was in the middle of a budget crisis and resources were scarce. When I came on board, the Merced campus had only 10 IT staff, mostly focused on desktop support and connectivity for existing staff in leased facilities. With only modest increases in staffing projected, we were expected to oversee the design and construction of voice, data and video network infrastructure in the five planned campus buildings and student residence complex; build the collaboration infrastructure (directories, e-mail, calendaring, document management, Web portal); and deploy major administrative applications (notably the student information system, which handles key functions such as admissions; course registration; billing, grade and transcript management; and financial aid). We also had to oversee the installation of AV facilities in classrooms, deploy instructional computer labs and develop a support organization for all of the above.

Making things even more problematic, there were no governance structures in place for defining a vision, developing a strategy or prioritizing needs. Not only was the (small) founding staff entirely consumed by trying to build their own assigned pieces of the university, but only some of the deans were on board and

ILLUSTRATION BY KEN ORVIDAS

no faculty members were hired. Nevertheless, people cared passionately about what IT facilities would look like.

In light of that passion, key UC Merced staff (before I was hired) went on a retreat to articulate a vision for the school's IT. So when I first visited Merced as a candidate for the CIO job, I was handed a draft mission statement for IT and a set of core values. But these contained little that was applicable in a practical way.

I strongly believe in a mission statement that directly informs a set of strategies that can, in turn, guide technology approaches and decisions. So my first challenge was to establish a new mission statement and strategies without rejecting the principles that had been previously articulated. It soon became clear to me that we did not have the resources to build everything that people wanted. It was also apparent that we would always be understaffed. In short, we needed to build an infrastructure for a 25,000-student campus with resources that already were insufficient for the 1,000-student campus planned for opening day. The one advantage we did have was help from our sister campuses. For example, UCLA was (and still is) running financial and payroll systems on our behalf.

Out of all of this, I evolved my plan of attack: Focus on the users to create an experience that would make UC Merced unique. In other words, structure our services in such a way

that access would be simple and natural for students, faculty and staff, as opposed to being built from the perspective of the various university departments. Build identity management as a core application and reduce staff needs via automated provisioning. Identity management is particularly critical in a university environment where individuals can be any combination of applicant, student, faculty, staff, alumnus or affiliate at the same time. For example, a graduate student may be an alumnus and is likely to be a teaching assistant. We needed to create a standards-based infrastructure that would be open, flexible, extendable and, above all, scalable.

Making the user experience as easy as possible was a top priority. To meet that goal, I was determined to develop a universal portal, informed by the identity-management system so that access to appropriate information and applications would automatically evolve along with an individual's role. This also meant integrating the user functions of administrative systems, such as the student information system, into the portal/single sign-on framework. It made sense for us to deploy open-source software developed by the university community, so we chose uPortal (developed by several JA-SIG institutions) and the Central Authentication Service (CAS, developed at Yale University). This would allow users to access applications from within the portal without having to

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Working feverishly, "just in time" became our mantra. One day, before we started accepting applications in December 2004, we integrated the self-service feature of our admissions system and assigned user IDs. We deployed the first phase of identity management in early summer 2005 so that we could automatically provision e-mail and other access to the incoming class. We completed networking the student residences at 9 the night before students arrived so they would have Ethernet drops and wireless connectivity from day one. Projection became available in the classrooms some time during the day classes began.

The Hard Road from Theory to Practice

Not everything evolved in the state we had hoped for. We had last-minute surprises as we discovered that contractors had not completed all of the details. We wound up doing things such as keeping our electrically operated projection screens permanently lowered because there was no power to make them operate. Procurement of equipment, especially for AV, was sometimes delayed because of arcane rules governing state purchasing and the avalanche of requests that fell on the purchasing department. Even the receiving department wasn't always able to distribute desperately awaited items on time. We had to resort to such workarounds as using a portable PA system and borrowing end-of-life projectors from a sister campus. And, of course, we had the occasional bug in a software package. For example, we had to partially disable our state-of-

the-art network-intrusion detection system when it began protecting the network so well that some new users were unable to obtain network addresses.

Nevertheless, everything essential was ready in time for our first entering class. There's a lot left to do, but we have a pretty good idea how to do it without having to undo anything we've deployed to date. For instance, we still need to integrate into our portal such applications as document management, calendaring and course registrations.

Looking back, a very small but highly talented and motivated IT staff performed miracles. Nevertheless, I don't believe it would have been possible if we had not established a very clear vision of what we wanted to do and how to get there. Even with limited resources, this vision allowed us to make quick decisions about interim solutions compatible with long-term strategy. For example, one professor wanted to have his students take online tests as part of a summer course he ran before our official opening. So we acquired a simple standalone package that used XML, allowing us to easily export the test questions for future courses.

As a leader, the CIO's job is to articulate and obtain buy-in to a shared vision. In my mind, it was that vision that enabled us to be ready for the campus opening on time, even if it was "just in time." **CIO**

Rich Kogut is CIO of the University of California, Merced campus. He can be reached at rkogut@ucmerced.edu.



Asiff Hirji

TOTAL LEADERSHIP

Continued from Page 37

must also excel at communication. However, the role of strategic leader means this CIO's influence extends beyond the technology group and the corporate management team. In the high-IT intensity environment, the CIO becomes a key external "face" for the organization, requiring both charisma and a keen business sense.

Leading the Evolution

No matter which type of company we work for, of course, we have to understand the interconnectedness of technology and overall business strategy. Our ability to provide corporate leadership, not just IT leadership, will be the key to becoming whichever type of CIO our companies need. At every company, today's CIO is expected to enable the business strategy by, among other things, keeping budgets flat, providing transparency and driving change across the organization.

To figure out which future role is right for your company, ask yourself whether IT provides a competitive advantage or is an integral support function. If you rank operational efficiency or client service as a core competency, you are less IT-intensive. If

IT cannot be separated from the business and is essential to your products, you're in a high-IT intensity business. Once you have the answer, your challenge is to buy or develop the talent that will enable you to move in the direction required to support the strategy of your firm.

Though it may seem as if the times ahead are uncertain, those of us who have dedicated our careers to the pursuit of exceptional IT leadership are on the cusp of something extraordinary. The changes in store for the CIO have potential to afford more opportunities for IT leaders than ever before.

Current and aspiring CIOs will be able to write their own tickets—to choose the type of organization they want to work in. These choices will be based on each CIO's skills, interest and sometimes the specific opportunity offered. And whatever *you* choose, you can continue to play an important role in your company's success. **CIO**

Asiff Hirji served as CIO with Ameritrade from 2003 until August 2005, when he was promoted to COO. Send comments to leadership@cio.com.



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A woman with dark hair is looking out of a window with horizontal blinds. The lighting is dramatic, with strong shadows. The blinds are partially open, showing a bright outdoor scene.

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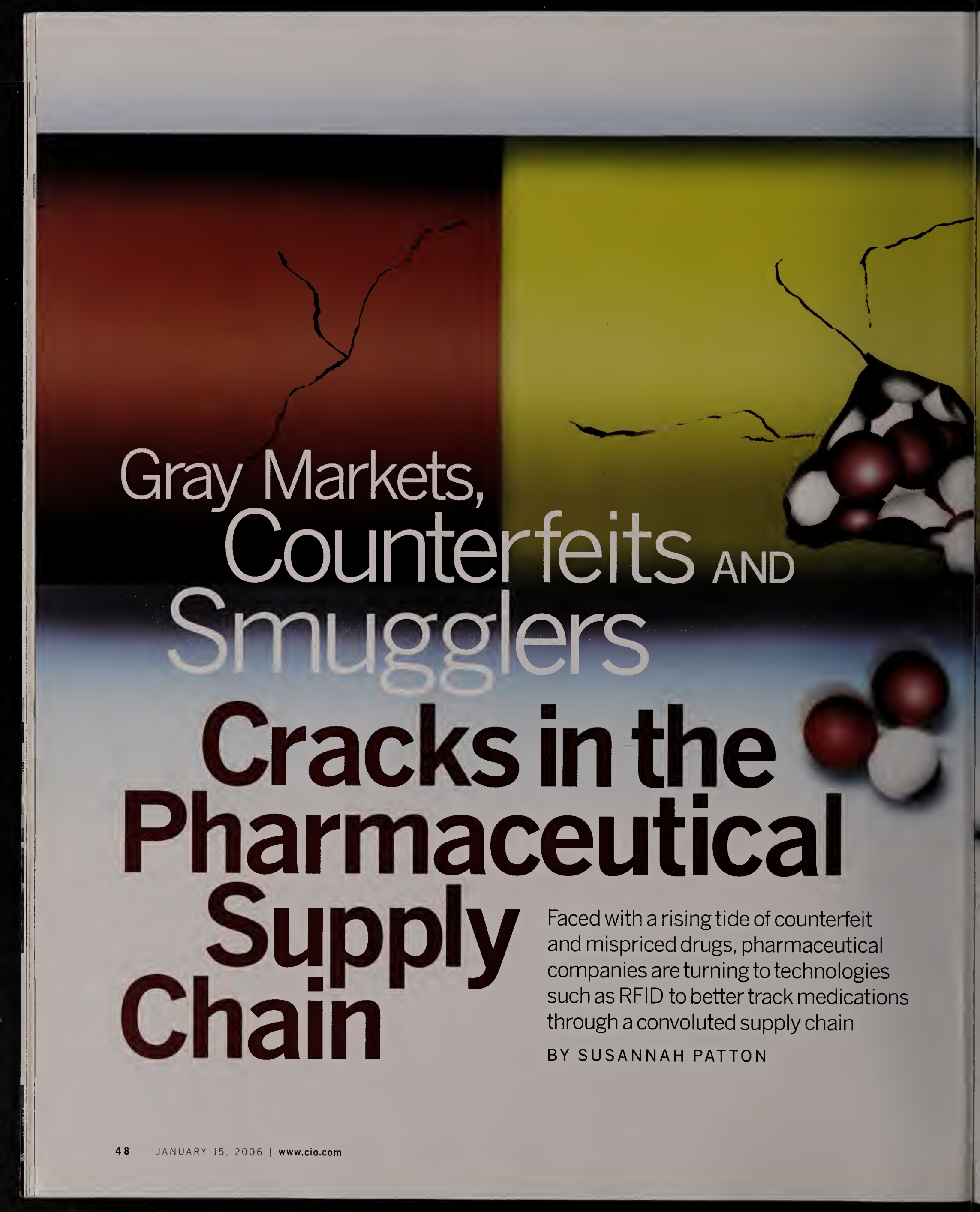
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Gray Markets, Counterfeits AND Smugglers

Cracks in the Pharmaceutical Supply Chain

Faced with a rising tide of counterfeit and mispriced drugs, pharmaceutical companies are turning to technologies such as RFID to better track medications through a convoluted supply chain

BY SUSANNAH PATTON

AS

an undercover agent with the Drug Enforcement

Administration and the Food and Drug Administration, Aaron Graham saw firsthand how counterfeit drugs can slip into the pharmaceutical supply chain. Graham, now VP and chief security officer for Purdue Pharma, once posed as the manager of an "institutional pharmacy" selling drugs at a discount to secondary wholesalers who were then supposed to sell them to nursing homes. Soon after he began, his phone started ringing. Dozens of smaller pharmaceutical wholesale companies were calling, desperate to buy his drugs. These secondary or "gray market" wholesalers scour the country and the world for low-price drugs they can sell back to major wholesalers for a profit. In addition to trawling for institutional pharmacies, some secondary wholesalers have been known to purchase counterfeit drugs from criminal organizations in places such as China, Thailand or Colombia.

Graham, who was part of a two-year FDA sting operation known as "operation gray pill," helped expose a system in which large and small wholesalers were taking advantage of multitiered pricing in the industry. Prescription drugs are sold at discounts to subsidized groups such as nursing homes and also exported at lower prices. Graham and his colleagues found that these lower-priced drugs are sometimes smuggled back into the country and sold to large wholesalers for a profit. These multiple steps, in which a drug can bounce back and forth from distributor to distributor, create a supply chain that is complex, convoluted and, at times, vulnerable. The more frequently a drug changes hands, the greater the chance that counterfeit or diverted drugs can enter the legitimate supply chain.

Such a porous supply chain poses hazards to patients—thousands of people worldwide die every year from ingesting fake drugs—and it costs the pharmaceutical industry an estimated \$46 billion a year in lost profits. The World Health Organization (WHO) in a recent study said that counterfeit drugs represent more than 10 percent of global sales. And in 2004, the FDA reported that the number of its investigations of counterfeit drugs rose by 150 percent from the previous year as a growing number of criminal groups take advantage of high profits and penalties that are less severe than those for selling illegal narcotics such as heroin or cocaine.

"Prescription drugs pass through so many hands before they reach the pharmacy, there is no way to know where they all come from," says Graham, who came to Purdue in 2002. "Laws on the books today

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- :: Why counterfeit and mispriced drugs are on the rise
- :: How pharmaceuticals are meeting mandates to authenticate their drugs
- :: What RFID technology brings to the supply chain table

ILLUSTRATION BY MATTHEW GOEBEL



MIKE CELANTANO, Purdue Pharma's associate director of supply chain systems, and **AARON GRAHAM**, chief security officer, have begun tagging cases containing Oxycontin and other Purdue drugs with RFID chips as part of a pilot tracking project.

are not effective in keeping counterfeit drugs out of the supply chain."

To fix the problem, pharmaceutical companies are under increasing pressure to plug holes in their supply chain, particularly in the distribution network that runs from manufacturer to customer. For instance, several states are now mandating that companies confirm the authenticity of their product by creating a "pedigree" that vouches for a medication's origin and who else has handled it. The FDA has recommended that pharmaceutical companies start using radio frequency identification technology (RFID) as a means of better tracking drugs. As a result, most pharmaceutical companies are experimenting with RFID, or at least using bar codes or other technologies such as Web portals that can help track and authenticate the drugs.

Purdue, along with several pharmaceutical giants, including Pfizer and GlaxoSmithKline, has started tagging some of its most popular drugs with RFID chips as part of a pilot program designed to track drugs from the manufacturer to the consumer. None of the technologies or techniques now being tested is trouble free, and most demand

a hefty investment in infrastructure and IT. Tagging drug bottles with RFID and collecting data on drug sales also raises privacy and security issues that have yet to be resolved. But those drug manufacturers not yet on the bandwagon can't wait for questions of standards or privacy regulations to be decided. With the help of their CIOs, who will design the IT infrastructure to support the new processes, they need to start pilot projects now to get ready for further mandates or risk getting left in the dust as the industry gears up to fight a dangerous global scourge. "Drug companies need to be seen doing everything they can to secure their supply chains," says Daniel W. Engels, director of the health-care research initiative at MIT.

Now You See It, Now You Don't

The pharmaceutical industry operates one of the world's most complex and opaque supply chains. The industry is heavily regulated, but the rules vary from country to country, as do the prices, generating a web of legitimate, quasi-legitimate and illegitimate trade.

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Although there are three main drug wholesalers in the United States—Cardinal Health, McKesson and AmerisourceBergen, which collectively control 90 percent of the prescription drug business—hundreds of smaller, secondary wholesalers also buy and sell excess inventory from the large wholesalers. A prescription drug commonly moves from manufacturer to several distributors and even “repackagers” before it lands at a pharmacy. Many of these small wholesalers are legitimate businesses that can help the supply chain run smoothly by efficiently finding buyers for prescription drugs. But they also add an extra layer that reduces visibility and creates opportunities for counterfeit drugs (including products with the wrong active ingredient or fake packaging) to enter the

distribution network.

Each year, thousands of people around the world die from taking counterfeit medication, much of which has been produced in squalid conditions. And developed countries are not immune. In 2003, 18 million tablets of the cholesterol-lowering drug Lipitor, the world's best-selling prescription drug in 2004, were recalled by Pfizer in the United States after fake pills were found in pharmacies. In 2004, fake Cialis, an erectile dysfunction drug, was found in the United Kingdom supply chain; and this year 120,000 packets of Lipitor were recalled in the United Kingdom after 73 counterfeit packets were found.

To prevent such abuses, federal and state law enforcement are devoting more resources to investigating criminal networks and

enforcing anticounterfeit laws. At the same time, the states of Florida and California have taken the lead in passing legislation that will push the industry to come up with a way to authenticate their products. Florida's law, effective in July of this year, requires drug wholesalers to provide a paper “pedigree,” or record of where drugs originated from. California's law, set to take effect in January 2007, will require an electronic pedigree or serial number for all prescription drugs sold in the state. Initially, drug wholesalers will be responsible for creating the pedigree, whether it is paper or electronic, although manufacturers will need to comply in the future as well. Some are skeptical that the industry will be able to meet these mandates, given the current state of technology adoption. “We move so many products that it is a challenge to do what Florida is requiring,” says Ron Bone, senior vice president for distribution support at McKesson. Bone, however, says his company already won't buy drugs without a pedigree when purchasing them from an “alternate source” or secondary wholesaler.

Admitting RFID Into the Hospital

A growing number of hospitals are using active RFID tags to keep track of expensive equipment and reduce waiting times for outpatient surgeries and procedures

IN THE PAST, doctors and nurses at Brigham and Women's Hospital in Boston often had trouble finding crucial cardiac equipment needed for emergency surgeries and other treatments. These pieces of equipment are large and expensive, ranging from \$1,600 for an EKG monitoring platform to \$4,500 for a cardiac assist device called a “pacer.”

“When these devices are misplaced there's a delay in care,” says Michael Fraai, the hospital's director of biomedical engineering. And when such valuable equipment disappears altogether, the hospital loses money.

To solve this problem, Fraai helped implement a radio frequency identification (RFID) system that tracks the devices in real-time. Starting in 2004, the hospital tagged pacers and telemetry transmitters with active RFID chips from Radians. The tag sends a signal to a receiver that links to the hospital's IS network. Using a Web-based application, doctors and nurses can log on to see where the equipment is located.

So far, the hospital has cut losses of certain cardiac devices by more than half. “Overall, we've saved money,” Fraai says. “We've been able to cut inventory shrinkage substantially.”

Brigham and Women's isn't alone. According to a recent study by the Spyglass Consulting Group, 10 percent of the 100 health-care organizations surveyed are using RFID to track equipment, and more than half said they would implement the technology this year. Still other hospitals are adopting RFID to track the location of doctors and patients and more efficiently schedule procedures in busy operating rooms.

Fraai says the technology still has room to mature. He'd like to see more intelligence built into his system so that if a device is approaching a door, an alarm would sound. Still, he's seeing a lot of enthusiasm from others in the hospital. “We're getting requests all the time to put RFID in different surgical areas and all around the hospital.”

—S.P

Different Ways to Track and Trace

Drug companies are working on an array of techniques to prevent counterfeit and mispriced drugs from slipping into the supply chain. Many are experimenting with holograms, color-shifting inks and watermarks that can help them authenticate the package and actual pills. Genzyme, which does the bulk of its business making specialty drugs to treat genetic diseases, is looking at using inks or dyes and is already using tamper-resistant packaging tape on some of its products. Genzyme is beginning to see some counterfeiting and price manipulation of its drugs to treat kidney disease and arthritis, says Jim Shuman, Genzyme's VP for materials management. For instance, wholesalers will sometimes buy drugs in one country where the government has negotiated a certain rate from pharmaceutical companies and then export the drugs to another country, where they can sell them at a higher price. “We now have products showing up in countries

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where they have never been sold," Shuman adds.

To better track its drugs around the world, Genzyme is testing a Web-based system, working with United Parcel Service (UPS) in Europe, to follow products distributed from its facilities in the United Kingdom and Ireland. Those at Genzyme who order the drug can visit the website to track a product delivery and follow the process using a traffic light system. If they see a green code, they know the delivery is on schedule, while yellow indicates a delay and red signals a problem. Shuman says that Genzyme is considering expanding the Web-based system with UPS to include more geographic areas.

Other pharmaceutical companies are working to create electronic pedigrees for their drugs through track and trace technologies such as bar coding or RFID. Bar-coding technology, which has matured over the past 20 years, is cheaper to implement than RFID, but it can be more expensive to maintain because it requires someone to read the package at each stage of the supply chain. Passive RFID tags, on the other hand, can be read automatically as unopened boxes pass by electronic readers in a warehouse. Paul Chang, associate partner at IBM Business Consulting Services, says that companies will be able to comply with the new state pedigree legislation using bar codes as well as RFID to authenticate their products. He predicts that these two

technologies will coexist for years to come.

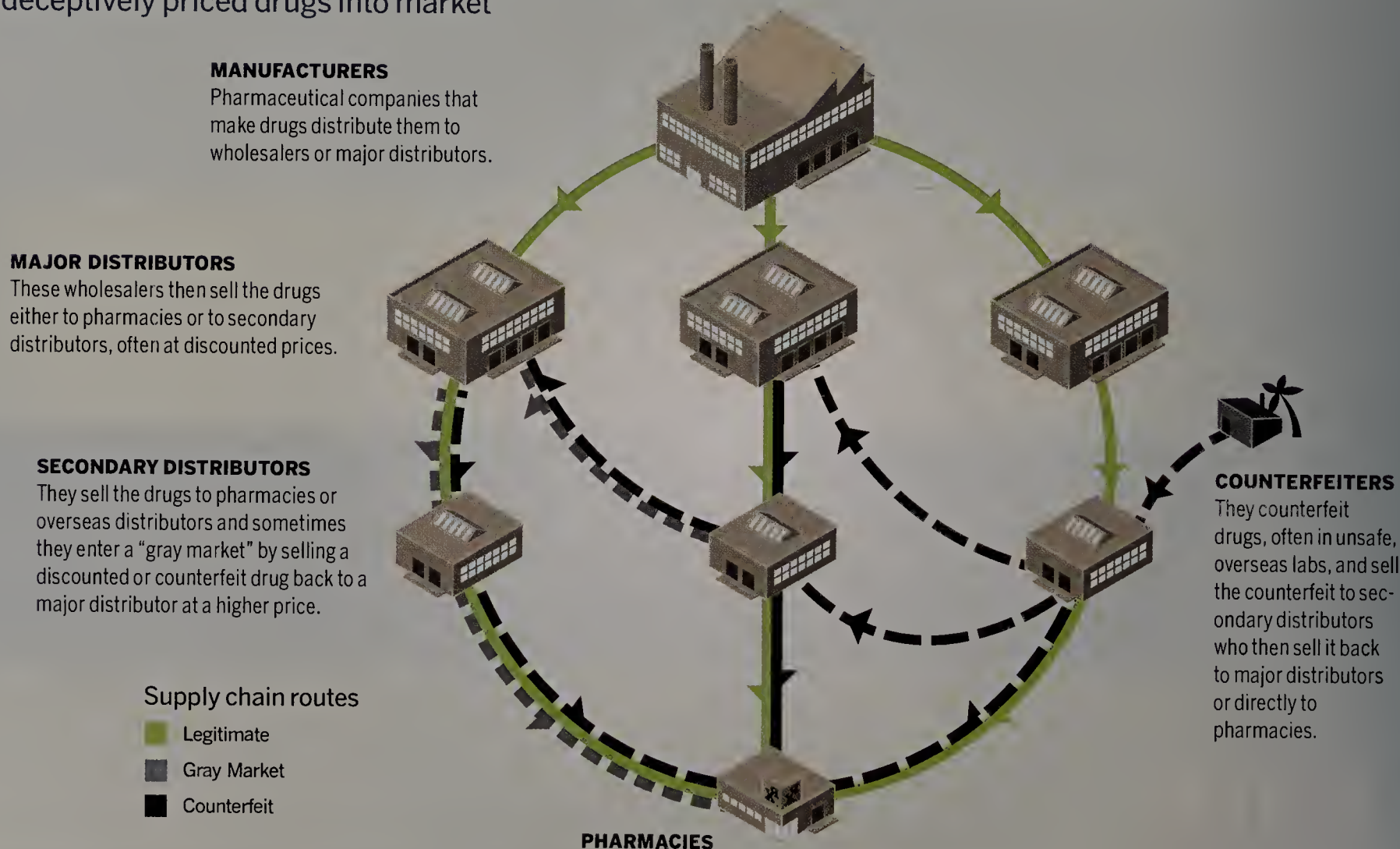
Pfizer and Purdue are ahead of the pack with RFID tagging pilots, if only because these companies produce Viagra and Oxycontin respectively—two drugs that have been more vulnerable to theft and counterfeit because of their popularity. These companies are trying out RFID because paper pedigrees are expensive to produce and can be forged and lost. "RFID is interesting because it's not just a bar code replacement," says MIT's Engels. "You can put sensors on it or log the product's temperature history and create a database on the products." Knowing the temperature is important because some drugs need a certain amount of refrigeration in order to remain active. (For more on the use of RFIDs in health care, read "Admitting RFID Into the Hospital" on Page 52.)

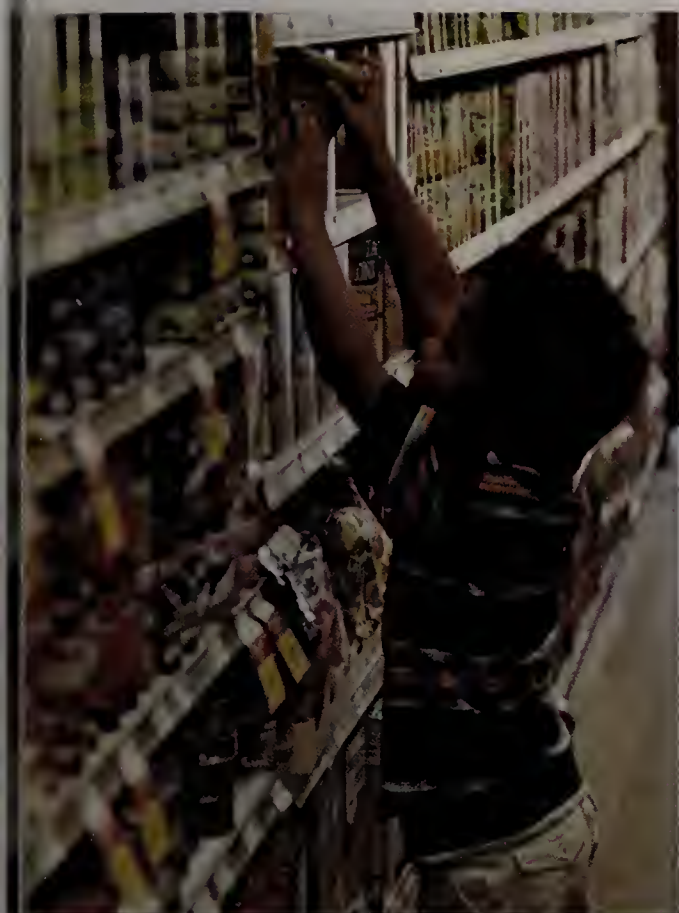
The Oxycontin Story

Even before the FDA came out with its statement in favor of RFID, supply chain executives at Purdue Pharma were working to meet a 2004 mandate from Wal-Mart that all shipments of "Class 2" narcotics, including the highly addictive Oxycontin, be labeled with RFID tags. While Purdue executives were wrestling with the new technology, they saw that it could also help them in the battle against

WHERE THE CRACKS ARE

The sheer complexity of the pharm supply chain makes it difficult to track the entry of counterfeit or deceptively priced drugs into market





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counterfeit drugs in the supply chain.

Mike Celantano, Purdue's associate director of supply chain systems and RFID, says that when his group first started to investigate RFID tagging, the technology was immature and there were few examples to follow. "Wal-Mart specified the frequency and the type of tags it wanted, and it was up to us to find a solution," Celantano says. Purdue figured out a way to tag the product as it moved along a high-speed production line before it ended up in cases that each contain 48 bottles of Oxycontin. Purdue met Wal-Mart's mandate and at the same time was able to gain experience with data collection and RFID's track-and-trace capabilities. Celantano used SAP's Aii middleware software to collect the information from the RFID labels.

Starting earlier this year, Purdue began testing an electronic drug pedigree using RFID tags to match each bottle of Oxycontin with a corresponding record that shows the drug's movement through the distribution chain. The idea, says Celantano, was to look at ways to pass along data from the manufacturer to the distributor and eventually to a hospital or pharmacy.

Before shipping a case of Oxycontin to its distributor, H.D. Smith, Purdue scans the shipment and records data that includes a unique electronic product code as well as a batch or lot number and expiration date. So, when H.D. Smith receives a shipment of Oxycontin from Purdue, the distributor can authenticate it, certify the pedigree and make sure its serial number—the electronic product code number—for each bottle of medication matches the corresponding number on the bottle's RFID tag. Celantano says the pilot shows that it's possible to create an electronic pedigree using RFID. In the future, he says, the process could extend beyond the distributor down to the retailer.

"The potential is tremendous from both an efficiency and a safety standpoint because you're introducing that ability to manage the product supply chain at a level of granularity that has never been seen before," Celantano says. When you can track and manage each case of pills, he says, it will be easier to match document cases as they flow through the supply chain. And distributors will no longer be able to disguise where the product comes from.

The Problem with RFID

Celantano acknowledges that anyone trying out RFID in the pharmaceutical industry is facing some serious challenges. "RFID is one way to tighten the supply chain, but it's not a panacea," he says. First of all, compared with the consumer packaged-goods industry, which is using RFID to tag cases and pallets, pharmaceutical companies need to label each bottle to create a system that

A portrait of Jim Shuman, a man with a mustache, wearing a dark suit, white shirt, and patterned tie. He is looking directly at the camera with a slight smile.

JIM SHUMAN,
Genzyme's VP for
materials manage-
ment, is testing a
Web-based system
to track products
distributed from the
company's facilities
in the United King-
dom and Ireland.

will allow for authentication. There are also questions about how radio frequency will affect biological products. According to McKesson's Bone, the industry still needs to be reassured that their liquid and biological medications won't be affected by RFID tags, although tests have shown that solid medications aren't damaged by the radio waves.

The cost of building the infrastructure needed for RFID and the lack of agreed-upon industry standards are also holding back mass RFID adoption. But Graham and Celantano say they are encouraged by the results of their initial trials. "At this point, no one knows the durability of the tags," Graham says. But he says that once the tags have been applied to the bottles, the tags are tested and if found defective removed before issued to the packaging line. As a result, the failure rate is low; only seven out of 200,000 RFID tags have failed inside the plant. (Purdue pays Symbol Technologies between 30 cents and 35 cents a tag and each tag is applied to a bottle containing 100 tablets.) Graham says they could scale up at any time if more in the industry decided to invest in RFID infrastructure and technology. But if more distributors and retailers don't sign on, there will be very few distributors able to read the tags.

Graham adds that electronic pedigree technologies like the one they are testing with H.D. Smith, Unisys and SupplyScape would "wipe out" a significant number of "gray market" wholesalers, thus tightening the supply chain. If manufacturers are able to track their drugs through the supply chain, then the smaller

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wholesalers will no longer be able to sell drugs they have purchased illegally.

While Purdue and other large drug manufacturers are experimenting with RFID, other companies are waiting to see what standards will be developed and how feasible the technology is. (For more, read "A Question of Standards," at right.) "I believe that the pharmaceutical industry as a whole is waiting for proof that RFID can work," says Dennis Kim, senior manager of supply chain operations at Tap Pharmaceuticals. At Tap, Kim says supply chain and IT leaders are working to understand how the technology can be applied and are reviewing pilot opportunities so they will be ready if they need to be. "RFID is expensive and the technology is becoming more robust, but it's not quite there yet," Kim says. "Most people are saying they're not going to commercial deployment until they have to."

Robert Cowie, CIO at biotech company Genzyme, says he believes RFID is a good idea for improving efficiency in the consumer product supply chain. However, he also does not think the technology is mature enough for his company to start using it. "The cost of the unit and its level of reliability doesn't make RFID economical for us right now,"

Cowie says. Forrester Research VP Laura Ramos agrees that most pharmaceutical companies should wait on RFID until the technology matures. Typical tag failure rates are not uncommon, and placing tags near certain metals and liquids can cause reader interference rates to climb higher, Ramos notes.

For now, companies that are taking the lead with RFID are those that sell either high-profile or very expensive drugs. Whereas it may not be economically feasible to buy a 30-cent RFID tag for a bottle of Tylenol, it would be more appealing for a \$50 or \$100 prescription.

The Big Brother Issue

Privacy concerns relating to RFID could also cloud the picture for the technology's easy adoption. Privacy groups such as the American Civil Liberties Union and Consumers Against Supermarket Privacy Invasion and Numbering, or CASPIAN, have raised concern over RFID use in the retail sector, fearing a loss of privacy if the technology is used to track what people buy and bring into their own homes. In the pharmaceutical industry so far, RFID tags are placed on the large bottles that pharmacies buy, but not on the bottles of pills that consumers take away from the pharmacies. Still, "privacy could be the killer issue that seriously limits the potential value of RFID in product tracking," says Forrester's Ramos.

Examples from outside the United States underscore how collecting data from medication down to the vial could raise concerns from privacy advocates. In Italy, for example, a law requires that each vial of a prescription drug have a unique ID. The vials, marked with bar codes, are read at each stage of the supply chain until they reach the pharmacy or hospital. Italian law requires that the data captured go

A Question of Standards

Many pharmaceutical companies want uniform standards for RFIDs in place before they make major investments

JUST AS SOME Wal-Mart suppliers in consumer goods have balked at the lack of standards for radio frequency identification (RFID) technology, most pharmaceutical companies are holding off on any major investment in their supply chain until there are agreed-upon standards in place. The problem now is that the industry hasn't agreed on a uniform frequency for the tags or on a specific type of hardware or equipment to read the tags. So even if a company starts using RFID, it's unlikely that their distributors or retail partners will have the technology to read the tags or make sense of the data. The companies also have to decide what type of data standards to use so they'll be able to share information they gather from the RFID tags and who will hold the data repositories.

The next generation of tags—known as Gen 2—were released last fall. A standards body called EPCglobal, the organization trying to make sure the electronic product code (EPC) eventually becomes the global RFID standard, is still working out the details. EPCglobal is a joint venture of the Uniform Code Council and EAN International, which are the standards administrators for bar codes. There are also industry-specific subgroups—including one for the pharmaceutical industry—working out their own standards, says Ron Bone, senior vice president of distribution support at McKesson, who is a member of the group.

—S.P.

directly to a central government database. While such an intrusion of privacy by the government would probably not be permitted in the United States, pharmaceutical companies have already gained access to individual prescription information from some pharmacy chains, and RFID tags on individual medications could accelerate that trend. (Under pressure from a recent class-action lawsuit, CVS was forced to stop its practice of sharing patient prescription information with major pharmaceutical companies.)

"Security and privacy will have to be addressed more fully than they have been, because when we create a network information system that spans the globe—as the pharmaceutical supply chain does—the data won't always be protected by VPNs or other secure networks," Engels says.

Despite such issues, Purdue's Graham believes that tracking and tracing technology represents the best chance so far to solve the problems he helped expose back in 1995. "Operation gray pill" ultimately led to more than 100 convictions and \$25 million in fines from drug wholesalers. An executive at the country's fourth-largest wholesaler at the time, Bindley Western, pled guilty to two federal felony and fraud charges after the sting operation revealed he had been directing people to buy from Graham and his colleagues so they could get a discount themselves. Ten years later, however, such fraudulent practices remain common.

"The system hasn't changed, and the loopholes remain in place," Graham says. "That's why track-and-trace accountability is so important." **CIO**

Senior Writer Susannah Patton can be reached at spatton@cio.com.



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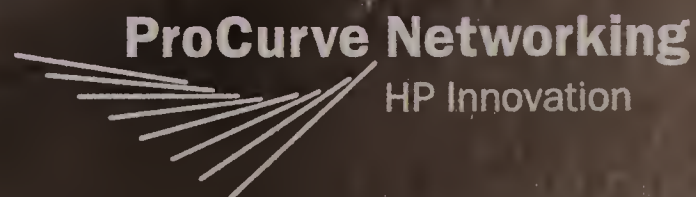
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Beating the Boomer Brain Drain Blues

BY SUSANNAH PATTON

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- :: Determine what knowledge is crucial and who has it
- :: Learn the CIO's role in retaining knowledge
- :: How to motivate experienced employees to help



The oldest baby boomers are six years away from retirement. Will your company continue to thrive if they take their knowledge with them? Here's how to identify who has key knowledge and how to keep it within the company walls.

In 1997, with the Cold War well behind

them, thousand of engineers who had helped design and maintain the B-2 bomber were asked to leave the integrated systems sector of Northrop Grumman. As the nearly 12,000 workers filed out the door, leaving only 1,200 from a staff of 13,000, they took with them years of experience and in-depth knowledge about what was considered at the time to be the most complex aircraft ever built.

Northrop Grumman knew it had to keep enough of that know-how to support the division's long-term maintenance of the B-2 bomber, so a newly formed knowledge management team identified top experts and videotaped interviews with them before they left. But it was hard to get everything in a single interview, says Scott Shaffar, Northrop Grumman's director of knowledge management for the Western region of the integrated systems sector. "We did lose some of that knowledge," says Shaffar. "In an exit interview, you can capture certain things, but not a lifetime of experience."

Northrop Grumman scrambled at the time to identify experts in key areas related to the program and to create a central repository for project documents. The aerospace giant kept enough of that knowledge to maintain and move forward with B-2-related upgrade projects, even as some expertise disappeared. Still, Northrop Grumman learned some important lessons about preventing a massive brain drain in the future.

Eight years later, the company uses a variety of tools to retain and transfer knowledge from its engineers—well before they retire. Shaffar and his team have put in place document management systems and common work spaces that record how an engineer did his job for future reference. They have started programs that bring together older and younger engineers across the country to exchange information via e-mail or in person about technical problems, and they are using software that helps people find experts within the company.

While most companies won't face the sudden departure of thousands of skilled workers, as Northrop Grumman did in the late 1990s, they and government agencies alike will need to prepare for the loss of important experience and technical knowledge as the baby boomer generation gets ready to retire over the coming decade. By 2010, more than half of all workers in the United States will be over 40. As of 2005, the baby boomers (the generation born after World War II) range in age from 41 to 59, and their numbers almost double the Generation X that follows them. And unlike their younger counterparts, many boomers have spent a large chunk of their careers in one company or agency, building up stores of experience and knowledge. While some KM experts downplay the issue, claiming that younger generations will take over and bring new skills as their older colleagues retire, it is clear that many companies are already feeling the pinch as those on the older fringe have started to leave the workforce. According to a study by AARP, more than 60 percent of U.S. companies are currently bringing back retirees as contractors or consultants.

Federal and state government, as well as industries such as aerospace, defense, energy and utilities, will be hit hard by the large-scale retirement of skilled workers, says David W. DeLong, author of *Lost Knowledge: Confronting the Threat of an Aging Workforce*. That's because such sectors generally rely on older, legacy technologies

3 Easy Steps for Preventing Brain Drain

1 Identify your vulnerabilities.

"Many companies don't know where they are most vulnerable to knowledge loss," says David DeLong, author of *Lost Knowledge: Confronting the Threat of an Aging Workforce*. One way to get around this is by doing an age profile of your workforce by work unit or by function. Determine the average age of employees in each unit and identify who's likely to retire or leave the company for other reasons.

2 Identify types of knowledge at risk.

Use interviewing and social network analysis software to find out what knowledge is most valuable. This will help you decide where to focus your knowledge-retention efforts.

3 Choose your tactics.

If you're focusing on transferring "tacit" knowledge, or experience that is hard to catalog, establish mentoring programs or communities of practice that bring older and younger workers together for extended periods. If you need to document information quickly before key employees retire, start developing databases and other repositories.

SOURCE: David DeLong

and have not hired large numbers of younger workers in decades. "The demographic shift and change in the coming workforce are incredibly serious in certain sectors and work units," DeLong adds. These companies and agencies in particular need to act quickly.

"Companies need to figure out who has the important knowledge, and they need to capture it before it's too late," says Carl Frappaolo, cofounder of consultancy Delphi Group. "If they don't, they'll be paying to reinvent the wheel."

Costs of Lost Knowledge

While most top managers are aware that they'll soon have a lot of workers retiring, few are doing much to prepare for the event. That's often because it's hard to quantify the cost of losing knowledge. "The baby boomer exodus is the elephant in the room when I talk to managers," says Mary Corcoran, vice president and lead analyst at Outsell, a research and advisory firm. "Most are not doing anything in a major way about retaining knowledge."

CIOs can take a leading role in preventing baby boomer brain drain by being prepared to respond quickly when management decides the company needs a KM system to help retain crucial knowledge. "CIOs need to know what's going on in this area because records management, search tools and databases will be running on their systems," says Frappaolo. In many cases, KM and human resources leaders can work closely with CIOs to put in place databases that track knowledge and other technologies as part of an overall plan. Northrop Grumman's Shaffar, for example, says he works closely with the IT department and spends more than 50 percent of his KM budget on IT—and will continue to do so. "How would engineers

connect across the U.S. if they didn't have e-mail, instant messaging or document management systems?" he asks.

Shaffar and other KM experts stress that even within a single company, brain drain won't hit all departments or units in the same way. Larry Mohl, chief learning officer for Children's Healthcare of Atlanta, a pediatric health-care organization, says his past experience at Motorola and American Express showed him that while knowledge loss is an ongoing problem, it's not pressing unless it involves a specialized skill that is crucial to the organization's success. Mohl says that natural turnover from retirement won't create a crisis at

The cost of getting bigger just got smaller.

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most companies. Still, he says, it's important to identify top performers in the organization and work to keep them and accelerate promotions as a way to ensure good succession planning. And if key people are going to be retiring, a company must act quickly to keep their knowledge.

Experts divide such critical know-how into two parts: explicit and tacit knowledge. The explicit kind refers to information that can be easily explained and stored in databases or manuals. Tacit knowledge is much harder to capture and pass on because it includes experience, stories, impressions and creative solutions. Tacit knowledge is also much harder to get from people because it accumulates over years of experience, and a scientist or salesperson may not even know how to verbalize it.

Dorothy Leonard, professor emerita of business administration at Harvard Business School and coauthor of *Deep Smarts: How to Cultivate and Transfer Enduring Business Wisdom*, argues that companies and government agencies should concentrate on re-creating tacit knowledge, rather than focusing only on transferring it (see a recent column by Leonard, "How to Salvage Your Company's Deep Smarts," at www.cio.com/050105). For example, if an experienced scientist plans to retire in a year, the pharmaceutical company where he works should have a younger researcher shadow the scientist and work side by side. "In this way, the younger scientist will learn not just the facts, but the method of diagnostics," Leonard says. "Databases are not a complete waste of time, but it's a mistake to believe they are transferring knowledge."

In some cases, it's easy to see that the loss of a key employee, or

group of employees, will affect a company's strategy and bottom line. At engine manufacturer Rolls Royce, for example, managers—when faced with the impending retirement of a veteran systems engineer—calculated that the engineer's retirement would cost the company \$400,000 in the first year, says Colin Cadas, team leader for design technology at the U.K.-based company. Cadas based the calculation on the number of employees whose productivity is affected when the system is down and the average time the system is unavailable. Using that calculation, managers could then justify the knowledge acquisition activity before the engineer (the primary troubleshooter for that system) left. The process also guaranteed increased training for younger engineers before the retiring engineer left the company. "For every knowledge retention project we do, we have those involved work out the business value to the organization," Cadas says.

Stop the Bleeding

Rolls Royce faced a crucial test in April 2003, when British Airways and Air France ended service of the Concorde supersonic jet, citing diminishing passenger numbers and rising maintenance costs. Rolls Royce, which had maintained the supersonic Olympus engines since the planes started jetting rock stars and business titans across the Atlantic in the 1970s, realized it needed to act quickly. And managers knew this specialized knowledge was crucial to securing future opportunities in hypersonic propulsion. So they set out to find the people with this experience, some of them already retired or moved away.

After finding the 46 people who had this specialized experience, Cadas set up a program that allowed younger, recently hired engi-

Teaching New Dogs Old Tricks

How Raytheon pairs experienced workers with newer employees

In 2003, executives at Raytheon Missile Systems decided they needed a plan to transfer knowledge between subject-matter experts and less experienced employees. Even without the problem of impending retirements, "You can never guarantee that people will be in the same place forever," says Mary Contini Gordon, Raytheon's manager of innovation services.

Gordon, with help from Sheryl Lain-Young, project manager for retaining corporate knowledge, created a pilot program that partners a senior technical expert with a junior colleague. A coach then helps the two work together. The first challenge was to find experts, who were identified by an executive coach. The experiences of Raytheon and other companies trying this approach shows that in most cases, subject-matter experts are eager to share their knowledge. Here are some tips to encourage your more experienced experts to get involved in mentoring and other types of knowledge-sharing programs:

■ **LET THEM KNOW HOW MUCH THEY ARE VALUED.** Experts are usually proud of their work. When the company recognizes them and singles them out as valued employees, they are often more than willing to pass along knowledge that will help them leave a legacy of their work.

■ **GET SUPPORT FROM TOP MANAGEMENT.** Even employees who are getting ready to retire may feel overworked and overprogrammed, leaving little time for meetings with junior staffers. If they are given the time or are relieved of some other tasks, they will not feel that it's an added burden.

■ **LET THE EXPERTS HELP DESIGN THE KNOWLEDGE-SHARING PROGRAM.** Depending on the area of expertise, older and younger employees may work side by side, but in other cases they may have to work from separate offices and meet regularly in person or by phone.

—S.P.

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neers to interview the older experts. The engineers met and went through a questioning process that enabled the younger employees to learn about supersonic technology and then to put that knowledge into a repository for future reference. "This was a double win for us," Cadas says. He adds that while in many cases older employees typically need some sort of incentive to participate, this time they were "falling over themselves" to teach the younger employees about the technology because they were proud of their accomplishments and were eager to see their knowledge retained for future use.

The experience at Rolls Royce illustrates an urgent situation in which a cutting-edge technology risks becoming obsolete. But the death of certain skills isn't always a cause for mourning. For example, few would complain that they can't find a typewriter repairman in the phone book. However, organizations must carefully analyze whether a technology or skill might be needed in the future. "Companies need to ask themselves, What can we not afford to lose?" says Melissie Rumizen, senior knowledge strategist at consultancy SAIC and author of *The Complete Idiot's Guide to Knowledge Management*.

KM Can Aid in Succession Planning

Some companies turn to software to help predict future departures and determine crucial knowledge. Succession planning or talent management software can give organizations a good picture of who is working for them, how they are performing and how long they'll be around. With retirement on the horizon and new management positions to fill last year, automotive chain Pep Boys started using succession planning software from SuccessFactors to give it a clear picture of all employees at the company's 584 retail and service centers. "The risk of knowledge loss will always be there because there will always be unexpected departures," says Liviu Dedes, Pep Boys' director of training and organizational development. "But if you have a solid process to map out who is in your leadership pipeline, you'll be better prepared to fill job openings, retain top-performing employees and prepare for retirement."

Dedes says that the software lets him check how many employees are near retirement age and how many might be leaving soon for other reasons. Another way to get a visual picture of human interaction and pinpoint the go-to people in an organization is to do a social network analysis (SNA), which often involves interviewing employees and managers to see who is working with whom, and whom employees go to most often for help. SNA software can help organizations map out relationships and get a clear picture of who has the most knowledge and experience in a specific area (for more on SNA, see "Who Knows Whom, and Who Knows What?" at www.cio.com/061505). The next step is to work on retaining those people, says Mohl at Children's

Red + dek
duration
name
key words

"The risk of knowledge loss will always be there because there will always be unexpected departures."

—Liviu Dedes, director of training and organizational development, Pep Boys

Healthcare of Atlanta. "You need to focus on helping these people advance as quickly as possible," he says.

Keep the Data

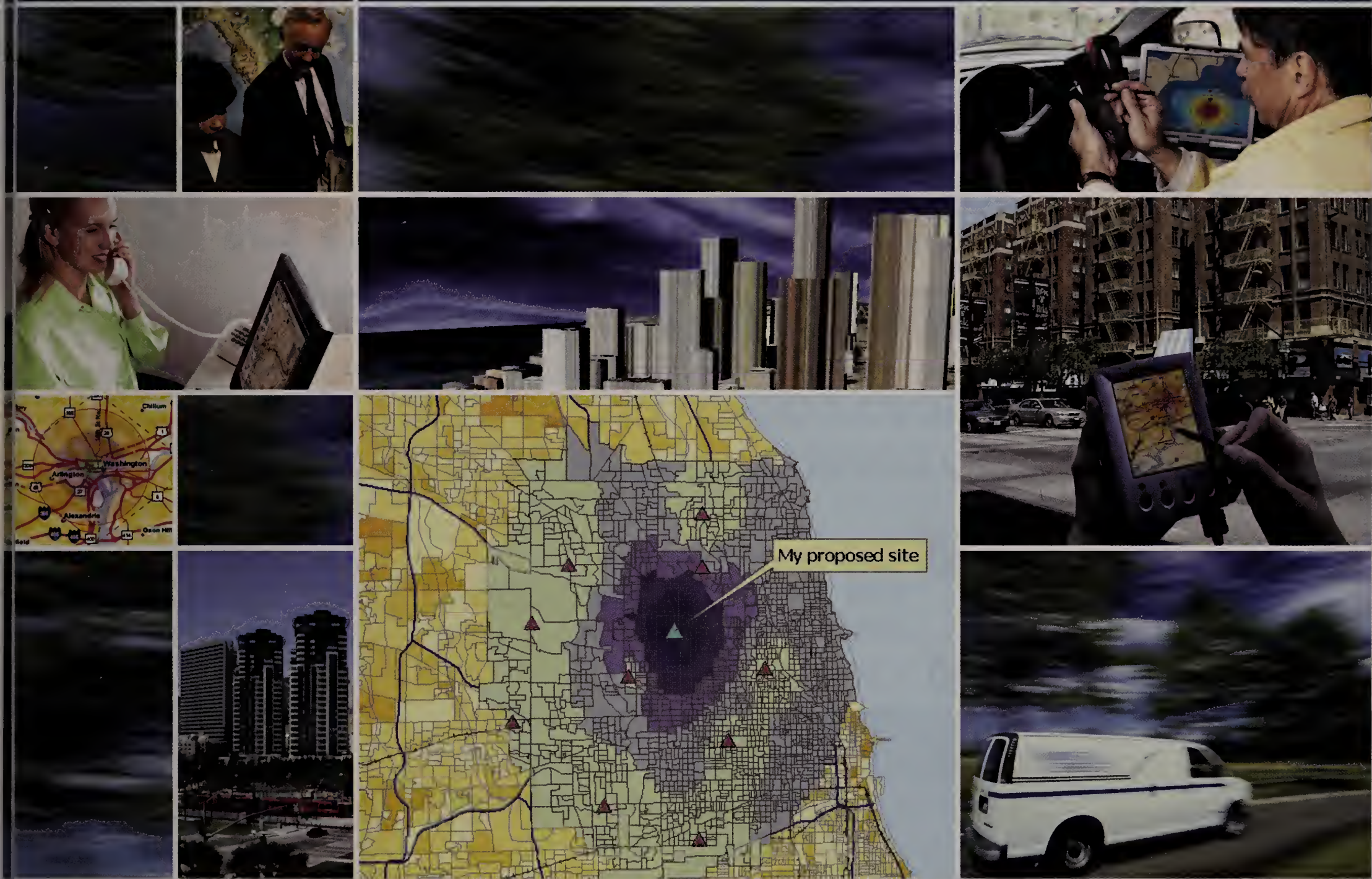
Once a company identifies key knowledge, it must develop the data-collection tools so that others can use it. In Illinois, where almost 10,000 out of nearly 60,000 state government workers have taken early retirement since 2003, a KM group has developed a database to capture the experience of buying government goods and services for the lowest prices. In the past, employees left without passing on the money-saving know-how. In one instance, the person responsible for buying cars and trucks for the state retired without leaving any information about vendors, prices or negotiating techniques. "When she retired, the new buyers had to start from scratch," says Paul Campbell, acting director of the Illinois Department of Central Management Services (CMS).

Illinois' central purchasing department, which spends close to \$8 billion a year, is facing heavy retirement in the coming decade. And it is not alone among government agencies—both state and federal. At NASA's Langley Research Center, for example, the first national civil aeronautics laboratory, 55 percent of the workforce is eligible for retirement. In an attempt to prevent a further loss of knowledge as the baby boomers depart, the state created a procurement database that brings together information from past purchases and includes vendor and product comparisons. With less than a \$20,000 initial investment, the department built the system as an add-on to its Lotus Notes e-mail system, easing the training for workers already familiar with that program. Purchasers can now search the database before they start negotiations with a vendor. "Before we had this, our buyers were at the mercy of the vendors," Campbell says. Illinois is now working with Microsoft to create a Web-based state procurement system that will eventually include information from other states.

KM experts caution that databases, portals and other electronic repositories are often ignored by workers who would rather get information from colleagues. "There are plenty of databases out there that are graveyards," says DeLong. But in some cases, he adds, lessons-learned databases and other technical tools are the only means of keeping information at hand for future use. While mentoring, shadowing and communities of practice can help train newer employees and encourage more experienced workers to pass on their know-how, cataloging key information as a reference can help cushion the blow of retirements. Common search tools and storage databases can then help retain such explicit knowledge.

At Bruce Power, a private nuclear power operator in Ontario, Canada, management saw the need for such tools several years ago when it became clear that 40 percent of its 3,200 employees were

Location, Location, Location...

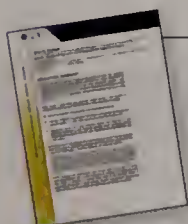


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Business Technology Leadership

Knowledge Management

nearing retirement age. Christophe Michel, Bruce's manager of technology solutions, started working on a project to create repositories of technical and HR information that employees can access from the Web. Using Kana IQ software, Michel and his colleagues have put together a dozen such repositories. One of the most successful in terms of usage, he says, focuses on technical questions related to welding, crucial for maintenance and safe operation of the plants.

In the past, he says, people would take pictures of welding jobs, for example, to share with colleagues, but the photos were not shared effectively. Now, images as well as technical instructions are available online. Michel says employees use the repositories if they save time and are useful to them. To encourage experienced workers to add information to the databases, the company measures such efforts on performance reviews. Michel didn't provide details on cost savings from the project, but says the initial investment paid for itself after one year by making up for the time workers used to spend trying to find the same information. Looking ahead, Michel says he hopes to motivate more workers to use the repositories by making the information available to them in the field on mobile devices.

Looking Ahead

At Northrop Grumman, times have changed since its massive downsizing in the 1990s. Although a large percentage of its workforce is nearing retirement, the average age of employees has dropped from

the high 40s to the mid 40s in the past four years since the company started hiring more college grads. Shaffar says he is now working on balancing the more gradual transfer of knowledge from older to younger workers with the need to capture some crucial expertise quickly before it's too late. For example, Northrop Grumman engineers who are competing on a proposal for a "crew exploration vehicle," which is being designed to replace the space shuttle and travel to the moon (and eventually to Mars), met in August with a group of retirees who worked on the Apollo program that sent men to the moon more than 35 years ago. Using a PC program called Quindi and a camera attached to a laptop, a facilitator recorded retirees telling stories about how they grappled with the technical problems of sending a man to the moon. These tales will be available as webpages for engineers working on this project. Shaffar acknowledges that employees would rather go to another person than a system for advice, but he says the exercise helped capture knowledge that otherwise soon would be gone.

Most important, Shaffar has learned that the problem goes beyond looking at what skills you have right now. "There have always been new generations, and we're not any different in that way," he says. "Mentoring, training and passing on knowledge is not something you can do at the last minute. You have to plan ahead." **CIO**

Senior Writer Susannah Patton can be reached at spatton@cio.com.



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Hosted, on-demand CRM is sometimes cheaper and easier to roll out than the software that lives on your own machines. But if you think on-demand means that all you have to do is flip a switch, you're dead wrong.

When Alex Marxer began looking at customer relationship management software, on-demand CRM wasn't even on his radar screen. As vice president of financial services for ResortCom International, a \$15 million business-process outsourcing company for vacation property developers and managers, Marxer was looking for an enterprise CRM system for sales, marketing, customer support, self-service and analytics. He needed software that was flexible enough to accommodate the changing needs of his sales and marketing staff yet would integrate well with the company's homegrown back-office applications containing all its customer contracts, invoices and financial transactions. So he had his sights set on traditional offerings from vendors like Siebel, Kana and Pivotal.

But then Marxer came across a hosted—or on-demand—CRM offering from RightNow Technologies that seemed to provide most of the functionality his business would need coupled with a particularly user-friendly interface. He was impressed with the price tag—just \$125 per user per month compared with the \$300,000 ResortCom would have to shell out for an onsite solution (not including implementation, infrastructure and support costs). So he signed a three-year contract with RightNow. “When we did the ROI calculations, it was an unbeatable value propo-

Reader ROI

- :: Why the rush to on-demand CRM
- :: How to figure out whether on-demand is right for you
- :: Why on-premise CRM remains the best choice for many

BY STEPHANIE OVERBY

The Truth About On-Demand CRM



Bettina Slusar, a senior VP at SunGard Data Systems, was looking only for certain aspects of CRM—sales-force automation and some marketing and campaign tracking. So an on-demand solution was a good fit.

sition," Marxer says.

Once the implementation began, however, Marxer ran into some problems. He wanted users to be able to launch RightNow applications as tabs within his back-office system. But that was impossible using RightNow's application programming interface (API) tools out of the box. RightNow sent a team to Marxer's San Diego office to work through a solution, which extended the implementation from the promised one month to three. Since ResortCom was entering its busy season (November through March), Marxer had to delay deployment until April. Since then, he has found that upgrading the RightNow software causes the integration with the back-office application to break. So he's had to hold off on upgrading to any new versions of the software—and forgo the valuable new functionality those upgrades would bring.

Marxer is one of thousands of executives who've made the decision to take a chance on the on-demand CRM model. It's a booming market—revenue from hosted CRM applications grew 105 percent last year, according to AMR Research. Small and midsize businesses and departments within larger companies have been drawn to these software-as-a-service solutions (payable on a monthly basis) because they're much cheaper than licensed on-premise software, which can cost anywhere from several hundred thousand dollars to several million up front. Salesforce.com, which created the model for hosted CRM in 1999 and developed a strong foothold in the mid-market, is now offering functionality beyond sales-force automation and trying to sell its product to much larger customers. And traditional CRM players like Siebel (now owned by Oracle) and RightNow have been forced by Salesforce.com's success to create hosted CRM solutions. Microsoft also recently announced plans to roll out an on-demand CRM product soon.

But despite the hype, the truth is that hosted solutions aren't going

to take over the CRM world anytime soon. As Marxer found, implementing on-demand CRM software is not always as simple as vendors would have you believe. Customization can be problematic. Hosted CRM vendors' API tools cannot provide the degree of integration that is possible with onsite applications. Getting a hosted CRM system working shouldn't take as long as a traditional software package, but larger and more complex rollouts can still take a year or more. And while the hosted option reduces the need for in-house technical support, upgrades can still sometimes be technically tricky, and ongoing business support of the software is critical. In addition, some companies with particularly sensitive customer data, such as those in financial services and health care, do not want to relinquish control of their data to a hosted third party for security reasons. As a result, AMR Research predicts that by 2009, hosted CRM applications will account for only 12 percent of the total U.S. CRM market.

"There's an expectation gap in the market," says Rob Bois, senior research analyst for AMR. Companies, he says, believe that "the on-demand model eliminates the up-front cost and effort required in implementing a CRM system; that it's just like turning on a switch. But the integration and customization requirements are not that dramatically different from traditional software when you get into more complex implementations. There's still a lot of work involved."

There are, of course, many situations in which the on-demand option will be the best choice: It should work well for companies that want to implement standard CRM processes, are able to use out-of-the-box data structures, have little or no IT support, or don't require complex or real-time integration with back-office systems. But as on-demand CRM extends further throughout the enterprise, it faces the same challenges as traditional CRM: ensuring widespread user adoption and integrating the system with other applications, says Rebecca Wetteman, vice president of Nucleus Research.

Is On-Demand CRM Right for You?

On-demand works better for some situations, on-premise for others. Here's a guide to choosing the right CRM system for you.

On-Premise

Companies seeking to implement highly customized customer-management practices

Companies that need specialized data structures

Companies with complex or real-time integration requirements

Companies with available in-house IT resources and support systems

Companies who can afford the up-front capital investment and fixed costs

Dealing with highly sensitive data that you don't want other parties to see

On-Demand/Hosted

Customers seeking to implement standard processes from a variety of industries and companies

Companies that are able to use standard data structures

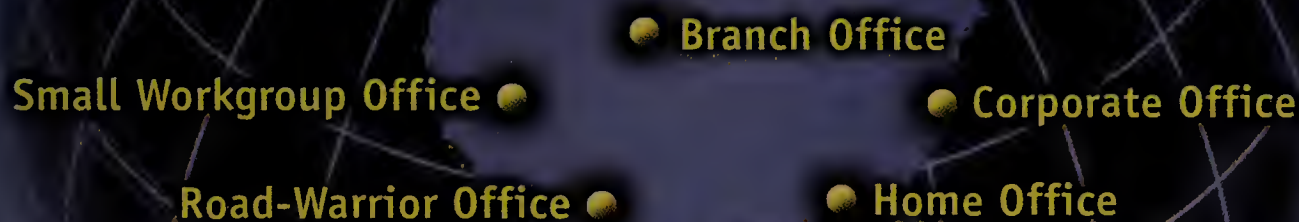
Companies with more basic integration requirements

Companies with limited technical resources and support personnel

Companies seeking variable pricing and lower up-front costs

Dealing with nonproprietary data

—S.O.



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Mid-Market: CRM

Some of the CIOs interviewed for this article chose an on-demand package, while others went with on-premise. They are candid about the pitfalls of either approach, but all agreed on one point: First you have to figure out exactly what your company wants from the CRM initiative and proceed from there. Price, they say, should be the last thing you consider.

"You have to have a strategic plan for what you want from your CRM initiative," agrees Paul Greenberg, president of The 56 Group and author of *CRM at the Speed of Light*. "Define your processes, figure out what your requirements are, decide who will execute on it. Then you can go through the costs of each model that actually meets your requirements and make a decision."

When On-Demand Is Worth Considering

Hosted software is nothing new. In the 1990s, hundreds of ASPs sprang up to offer customers enterprise software hosted over the Internet. But when the Internet bubble burst, many ASPs went belly-up, leaving customers in the lurch. But Salesforce.com focused on the niche need for sales-force automation, refined its technology and began racking up sales among small and midsize businesses that needed the functionality they could offer but couldn't afford the multimillion-dollar price tag that accompanied full-fledged CRM implementations. And as the number of expensive failures in the traditional on-premise CRM space grew, so did interest in expanding the hosted model beyond simple sales-force automation—to a full-fledged system that could give enterprises a holistic view of their customers and allow them to better target their marketing, sales and customer-service efforts.

Traditional enterprise software vendors soon struck back, attacking on-demand on the grounds that it wasn't scalable to more than 1,000 users. But as it turns out, size is not what really matters in determining whether a hosted CRM implementation will be a success—it's complexity. And complexity makes it harder to implement a viable CRM package, regardless of whether it's hosted or on-premise. "It isn't a scalability issue," says AMR's Bois. "Typically when you're talking about an organization that will have more than a thousand CRM users, you're talking about a broad implementation that will touch more areas of the company and will involve more business processes."

Companies seeking to adopt established, standard practices on a particular function like sales-force automation are more likely to



As **Alex Marxer**, VP of financial services for ResortCom International, discovered, installing on-demand CRM is not always as simple as vendors would have you believe.

benefit from a hosted solution, while those seeking to implement highly customized customer-management processes would more likely value a flexible onsite option.

Take SunGard Data Systems, for example. For Bettina Slusar, SunGard's senior VP of global accounts management, opting for an on-demand solution in 2002 was a relatively easy decision to make. Although she had a user base of more than 1,000 to consider, her plans to drive standard processes in the global sales function of her \$3.5 billion data-center company led her straight to Salesforce.com. Having grown through more than 100 acquisitions, SunGard's scattered and independently operating sales force hampered the company's ability to get an accurate and timely enterprise view of the sales pipeline. In addition, SunGard was looking only for certain

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aspects of CRM—sales-force automation and some marketing and campaign tracking. So Salesforce.com was a good fit.

But Slusar admits it's not for everyone. "If you want one big system that's going to connect all the dots together—from talking to the customer to signing the deals to connecting to the accounting system—[Salesforce] is not the answer," she says.

IT support was also a factor in Slusar's decision. SunGard's busi-

"The integration and customization requirements of on-demand CRM are not that different from traditional software. There's still a lot of work involved."

—ROB BOIS, AMR RESEARCH

ness is built on running data centers for other companies, but there is no centralized IT function for internal support. "We never really seriously considered an in-house solution for this. Our sales force spans the globe, and administratively it would have been a big headache to maintain the application and keep servers up and running with people coming online in Hong Kong and Chicago," Slusar says. In addition, she says, there was "no comparison in terms of pricing." Traditional software would have cost \$18,000 per user over the course of a two-year license, and though Slusar will not reveal how much SunGard pays for the Salesforce.com systems each month, she says the cost is "magnitudes" lower, ranging between \$1,560 to \$3,000 per user over the same period (not including training and customization).

When On-Premise Is a Better Fit

At Qosina, a medical-components distributor, the basic business need was the same as SunGard's: creating an enterprisewide snapshot of the sales pipeline. Yet this much smaller company—\$25 million in revenue—chose an on-premise offering in large part because of the complexity of its business processes, according to Chief Operating Officer Gerry Quinn.

The company had been using an old flat-file, DOS-based contact manager called Telemagic for years and, in 2003, was ready to

replace it with a more modern, robust CRM package. Qosina, which markets its products (such as tubing, clamps and valves) through trade shows, catalogs and websites, has an inordinately long sales cycle as the components it sells are eventually incorporated into products developed in the medical and cosmetics industry. To encourage the purchase of its products, Qosina sends out samples of its 5,000 products (some costing less than a penny a piece) at an average rate of 300 to 500 a day and up to 1,000 a day after a successful trade show. For example, Qosina may provide samples during a customer's R&D process, and only when the customer's product is approved for production will Qosina make its big sale. Quinn wanted a dynamic tool to support the company's atypical marketing and sales process. "Our processes, while not totally unique, weren't anything that could be supported with an out-of-the-box package," he says.

Quinn looked into customizing a hosted solution to accommodate the company's elongated sales cycle, but ultimately rejected the idea because the company already had the technology infrastructure in-house to support an on-premise system (Qosina has hosted its own website for 10 years). Quinn also wanted to retain power over the application and the data in it.

Security concerns often can be a sticking point for CRM customers. "Will my information be secure in a hosted environment? Will I have access to it? Who will own it? Will competitors be able to view my customers? These are important questions," says Wayne Latterell, president and founder of CRM consultancy Portico Solutions. "Imagine—would you put your company's financial data on the same server as that of your competitors?" Some customers will be satisfied with the hosted vendor's security measures, while others may not want to risk it.

"We wanted more control," Quinn says. "We didn't want to put our sales pipeline out there in a hosted environment with someone else controlling the servers." He had heard horror stories about ASPs in the dotcom era, such as some closing their doors without giving notice to clients, leaving them with no system and no way to re-create one, and others selling the customer data they hosted. While he knows that most hosted CRM providers today are much more reliable, Quinn says, "putting our proprietary information outside our firewall, spam filter, intrusion detection and virus-scanning software would be putting a great deal of faith in the hosting company. We may not have the same global resources as larger hosting companies, but at least internally we can hold someone accountable."

Quinn looked at several CRM systems including Siebel, Saleslogix and Goldmine, but ultimately chose Microsoft CRM so that he could more easily integrate it with the Great Plains ERP package Qosina had put in place the year before.

Dialing Into the Back Office

The level of integration required between a front-office CRM system and back-office systems is another factor to consider when choosing between hosted and on-premise CRM. On-demand CRM vendors are offering ever-more robust integration tools. But, says

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AMR's Bois, "integration is always going to be an issue with software-as-a-service because you don't own the application or have access to the source code." And more sophisticated real-time integration with back-office transactional systems isn't possible with on-demand CRM software—at least today. "There's movement in that direction, but they can only import flat files asynchronously in batches," says Bois. "Companies that need to do that kind of [real-time] integration are more likely to stick with licensed software."

"It's not that on-demand software *can't* integrate," says Greenberg of The 56 Group. "It's just that the integration tools in traditional on-premise software are better. The more complex the integration requirements, the better off you'll be with onsite software."

ResortCom's Marxer says the integration of the RightNow on-demand software with his back-office system is satisfactory, but not what he would call ideal. "RightNow delivered on all the integration points we needed and the performance was reasonable," he says. But to open up a customer incident report, which an employee does only when an incident cannot be resolved on the first contact, takes 10 seconds because of the back and forth on the back end. That's just fine for ResortCom's needs at the moment, but "there's some room for improvement," he says.

Mike Davis, CIO of Stewart Information Services, agrees. Like Slusar at SunGard, Davis had to think about the needs of the far-flung sales and customer-service organization supporting the \$2.2 billion title-insurance company he works for. With a requirement that the software eventually support at least 4,000 and as many as 8,000 users, Davis had the option of becoming one of Salesforce.com's largest customers to date (in fact, small pockets of people within the company had already started using Salesforce.com on their own). But unlike Slusar, Davis ultimately purchased a license for Onyx's on-premise CRM product.

Davis wanted to tie the CRM to all of Stewart's "day-in and day-out" systems. "We needed the most flexibility we could get in integrating it," says Davis. "And [Onyx] seemed to have much easier ways [than Salesforce] to integrate our system with theirs and theirs with ours—three different levels of embedding and exposing the information. There were modules of code available to use within our systems to make it easier."

Salesforce.com also has ways to get data in and out of Stewart's applications, in an import-export fashion, Davis says. But it would have required users to manually initiate the imports and exports in a less-seamless fashion than he would have liked. "We might have been able to make it work," says Davis. "But it wouldn't be very efficient. And it wouldn't have made for a very good user experience."

The Major CRM Players

On-Demand CRM Only

Entellium: Includes functionality for sales-force automation, marketing automation, and service and support.

iRadeon: Focused on sales-force automation.

NetSuite: Includes functionality for sales-force automation, marketing automation, and service and support. Also offers integrated functionality for financial management, e-commerce and other enterprise operations.

Salesforce.com: Includes functionality for sales-force automation, marketing automation, and service and support. Also partners with other companies to provide more specialized functionality for HR, finance, health care and e-commerce.

SalesNet: Focused on sales-force automation.

On-Demand and On-Premise CRM

Kana: Focused on customer service and service-resolution management.

Microsoft: Provides sales-force automation, marketing automation, and service and support functionality predominantly for small and mid-market companies. Currently offers on-demand solutions only through its partners.

RightNow: Provides functionality for customer service, sales-force automation and marketing automation.

Siebel CRM (now owned by Oracle): Provides a suite of solutions for marketing automation, sales-force automation, call center and service, self-service and e-billing, customer-order management and partner management. Siebel's on-demand solution provides functionality for contact center, sales-force automation, marketing automation, and service and support.

On-Premise CRM Only

mySAP CRM: Includes functionality for marketing, sales, service, e-commerce, contact center, and channel management.

Onyx: Provides marketing automation, sales-force automation, service and support, contact center, partner-relationship management and customer-performance management.

Oracle: Has basic functionality for sales-force automation, marketing automation, and service and support.

PeopleSoft: Offers functionality for sales, service and marketing, as well as analytics and vertical-specific solutions.

SalesLogix: Includes functionality for sales, marketing, customer service and support for small to midsize businesses.

SOURCE: Nucleus Research

Easy for You, Difficult for Me

One of the major selling points for on-demand CRM is its relative ease of implementation, particularly in contrast to the expensive and lengthy rollouts that have plagued the traditional CRM customer.

Indeed, at Qosina, the Microsoft on-premise implementation took more than a year. And the biggest cost was consulting fees, which, at \$280,000, made up half of the implementation expenses. Davis of Stewart Information Services is just finishing his Onyx pilot (for six sales-force units), which also required the added expense of two



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full-time and two part-time consultants. It took seven months longer than expected because midway through the process, Davis discovered some additional functionality that would be needed for the regional sales offices.

"It's taken longer than I thought," he acknowledges. "The biggest hold-up just has to do with change in general," including getting users to adopt the systems and change the way they work. The integration that drove the decision to go with an on-premise product won't even happen until the next phase of the rollout. "It's a long road," Davis adds.

For companies that can adjust to an on-demand CRM system out of the box, implementation takes less time. But it would be a mistake to assume that all hosted CRM implementations are quick and easy. In fact, most take time to roll out enterprisewide and many require bringing in consultants to help out. "Some customers have the expectation that you flip a switch and you're done," says Bois. "But there are setup costs and training costs and ramp-up costs. There's getting the system customized to match the business context and then getting people to use the system. CRM implementations are still complex, even if they're delivered in an on-demand fashion."

At SunGard, a smaller and more narrowly defined rollout of Salesforce.com took a full year. "We had to do a fair amount of work lining up what we wanted to accomplish with what [Salesforce.com] could provide," Slusar explains. SunGard also had to bring in consultants to assist with the rollout and accompanying change-management issues. Some of that effort was devoted to standardizing data definitions in order to preserve data integrity. Because the company had so customized the software's template to meet the needs of its global sales force, there was no way Salesforce.com's online training would work. Slusar rolled out the system in phases until 90 percent of her user base was on it by the spring of 2004. "We still could do more to drive standardized behavior and usage that we haven't," Slusar says.

Looking forward, Slusar has created a team to oversee the Salesforce.com product over the long term. They will work to increase user adoption and also keep track of new offerings from the vendor as well as from "the mushrooming number of partners that have popped up all over claiming they have something that works well with Salesforce.com," says Slusar. (Applications offered by companies partnering with Salesforce range from Web-based HR recruiting and screening tools to call-center scripting and software that helps doctors take notes on wireless handhelds.)

"The good news is there are a lot of things you can do with this system," Slusar says. "The bad news is you need people to do it. And I already have a full-time job."

Different Delivery Model, Same Risks

Marxer is sticking with the hosted solution, even though RightNow had a clause in its contract that ResortCom could buy a license and take the software onsite if Marxer wasn't pleased with the results. Although he's had to hold off on upgrades to date, he's hoping they

"If you want one big system that's going to connect all the dots together—from talking to the customer to connecting to the accounting system—Salesforce is not the answer."

—BETTINA SLUSAR, SUNGARD DATA SYSTEMS

won't pose a problem when RightNow adapts a true Web-services integration platform.

In the meantime, the on-demand system has yielded some solid ROI. The self-service function has reduced customer e-mails by 40 percent, and workflow has improved between back-office and front-office functions, resulting in a 40 percent improvement in productivity. And ResortCom has been able to introduce some automated marketing functionality that Marxer predicts will boost its bottom line this year.

Marxer credits the progress he's made with his on-demand CRM solution not to the technology itself, but to the two years he spent preparing the organization for the changes that would be required—preparation that would have been the same regardless of which delivery model he chose. "Back then, we didn't have the money or maturity to do a full-blown implementation. [As a result], I was able to do all the prep work necessary on a cultural level way before we even put out the RFP," Marxer says.

It remains to be seen whether more complex on-demand CRM implementations ultimately succeed or suffer the same fate as many large-scale on-premise CRM projects have. "Because most of these are monthly investments and in the past were smaller deployments, we haven't heard about the big disasters yet," says Bois. "The larger implementations will be the ones to watch," he says.

"On-demand CRM may be a less-expensive risk, but it's just as big a risk," says Greenberg from The 56 Group. "If you haven't planned everything out, customers will get lost. People will get fired. You will fail." **CIO**

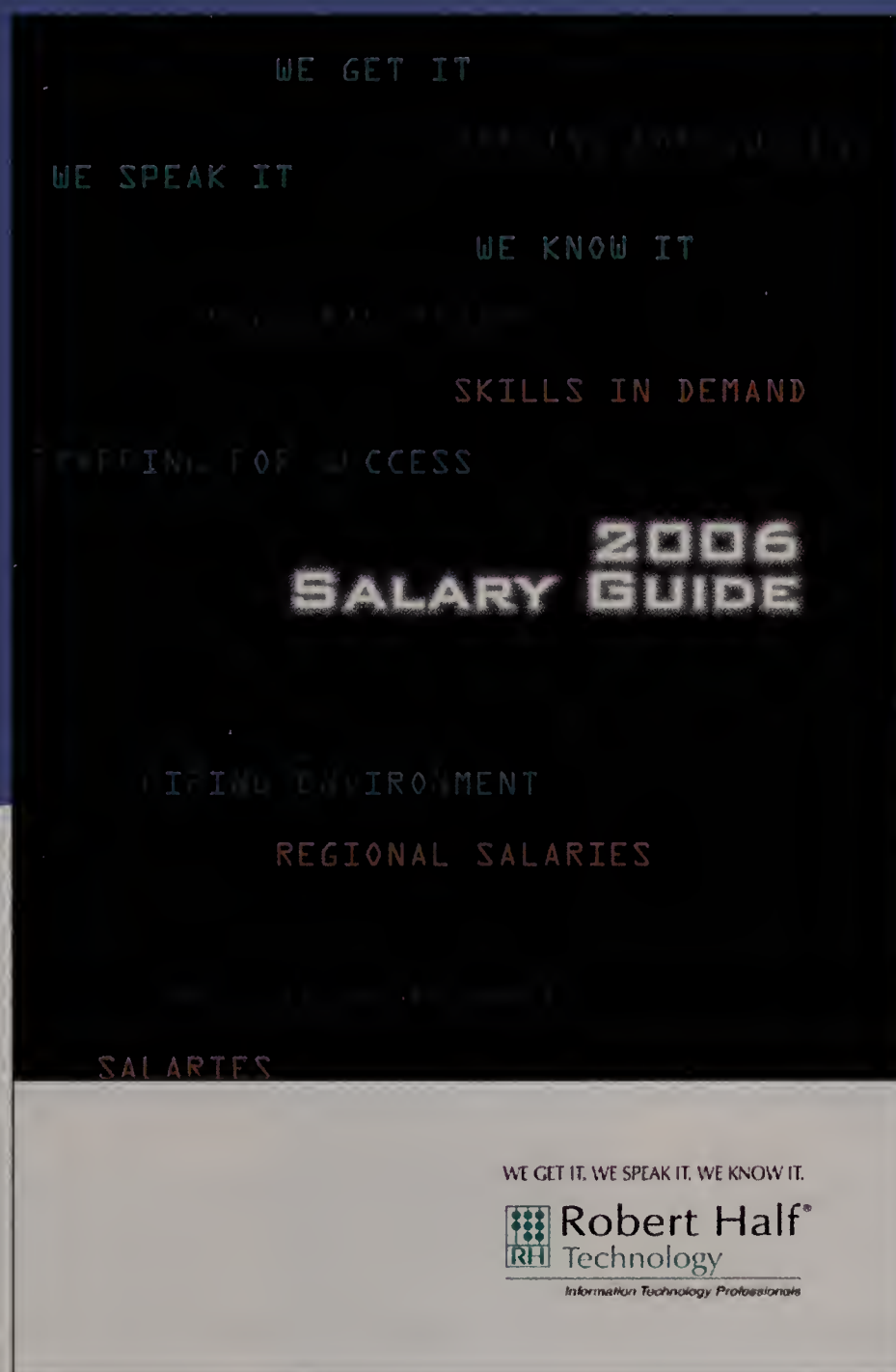
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BUSINESS INTELLIGENCE:

Not Just for Bosses Anymore

Business intelligence has long been about spitting out data—often irrelevant and outdated—to a few big bosses. But today's BI is both more meaningful and more egalitarian. And it requires ever tighter alignment between IT and the business. BY MERIDITH LEVINSON

Reader ROI

- :: Why the traditional roles of BI technology are no longer valid
- :: How to reorganize BI projects to deliver more value
- :: When business processes should be changed to take advantage of BI

JIM HONERKAMP, CIO of Hillman Group, is proud of his new business intelligence (BI) system. And why not? It's much better than what came before. In the bad old days, executives looking for sales information, for example, had to ask one of Honerkamp's programmers to make a manual database query to pull the numbers from the company's legacy systems. The lag time made the charts "stale the minute they came out," according to Honerkamp, whose company is a \$380 million manufacturer and distributor of engraving technologies and hardware such as keys and signs.

But with Hillman Group's new BI system, curious business executives can query the system themselves and get instant answers about such critical questions as the number of unfilled customer orders, which is tracked by the system in real-time.

There's just one problem.



At Quaker Chemical, CIO Irving "Bubba" Tyler gives BI tools to 40 percent of his company to make it part of routine workflows.

Business Intelligence

The new system hasn't made the business better—at least not yet—only better informed.

That's generally the problem with BI, the umbrella term that refers to a variety of software applications used to analyze an organization's raw data (sales transactions, for example) and extract useful insights from it. Most CIOs still think of it as a reporting and decision support tool.

Though the tools haven't changed much recently, there is a small revolution going on in the ways BI tools are being deployed by some CIOs. Done right, BI projects can transform business processes—and the businesses that depend on those processes—into lean, mean machines. "Today, the big potential for BI is using it at the operational level to improve business processes," says Colin White, founder and president of consultancy BI Research.

For example, Steve Phillips, CIO at Avnet, a computer systems, component and embedded subsystems manufacturer, has used BI to improve the performance of the company's sales and customer service processes. At Quaker Chemical, CIO and VP Irving "Bubba" Tyler, has used BI to help transform the company from a regional operation to a unified global business.

QUANTUM LEAP

But taking BI to the next level isn't easy. It requires a change in thinking about the value of information inside organizations from the CEO down, says White. Information is power, and some people don't like sharing it. But sharing is vital to this new vision of BI, because everyone involved in the process must have full access to information to be able to change the ways that they work.

Another problem is the BI tools themselves. Though the tools are more scalable and user friendly than they used to be, the core of BI is still reporting rather than process management, although that's slowly beginning to change, says White.

Finally, the other major impediment to using BI to transform business processes, according to White, is that most companies don't understand their business processes well enough to determine how to improve them. And companies need to be careful



CIO STEVE PHILLIPS says BI helps Avnet employees improve their work practices with less effort.

about the processes they choose. If the process does not have a direct impact on revenue or the business isn't behind standardizing the process across the company, the entire BI effort could disintegrate. White says companies need to understand all the activities that make up a particular business process, how information and data flow across various processes, how data is passed between business users, and how people use it to execute their particular part of the process. And they need to understand all this *before* they start a BI project, if they hope to improve how people do their jobs.

NO LOOKING BACK

Reaching beyond BI's traditional decision support mode is difficult, but CIOs can get there. They can use some of the recent improvements in BI tools—such as easy-to-read dashboards and guided workflows that help users understand how to act on information and how to incorporate it into their day-to-day activities—and use those

improvements to sell the business on making the project more focused on business transformation.

To do that, CIOs are using the improved scalability of the tools to roll them out as widely as possible—not just to bosses, as in the old days. For example, 40 percent of Quaker Chemical's 1,200 employees are active, registered users, according to Tyler. "Our big program at Quaker Chemical has been to make these tools and capabilities available to as many people as possible and in as simple a way as possible so they feel comfortable incorporating it into their routine workflows," he says.

The new, greater scope of these BI projects gives CIOs a strong justification for working with the business to study processes and determine how these tools and the insights they provide can support and improve them.

Companies that use BI to uncover flawed business processes are in a much better position to successfully compete than those companies that use BI merely to monitor

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what's happening. Indeed, CIOs who don't use BI to transform business operations put their companies at a disadvantage. For CIOs who have carried out this difficult strategy successfully, there is no looking back.

FROM REPORTS TO SERVICE: AVNET

Avnet took the new process-oriented BI strategy directly to the processes that matter most: selling and serving customers. The company has put together a system from three BI vendors—Informatica, Business Objects and InfoBurst—to generate reports on orders, shipment schedules and dates by which Avnet will no longer manufacture certain products. But reports were just the beginning. To transform the sales and customer service processes, Phillips rolled out the system to 2,000 salespeople so that they could actively incorporate that information into their day-to-day workflows and interactions with customers.

Employees use the information to modify their individual and team work practices, which leads to improved performance among the sales teams. When sales executives see a big difference in performance from one team to another, they work to bring the laggard teams up to the level of the leaders. "We try to identify [using our reporting tools] where best practices exist inside our work teams and then extend those best practices across the company," says Phillips.

One of those best practices is to alert customers if a product they have purchased in the past is about to be discontinued. Salespeople can ensure that customers have ordered enough for all of their future needs or identify a new component to replace the one that's being phased out. Those kinds of conversations boost sales and convince customers that Avnet's salespeople are looking out for their needs and interests.

It helps that Avnet's sales team is flexible and willing to adapt to the information. "Because our sales team is so flexible, they'll take this information [from BI reports] and [change] processes [when they see a benefit to it]," says Phillips. Sometimes, they don't even realize they are changing the ways they work—a kind of organic reengineering. Indeed, salespeople benefit so directly from better information and have such a big

Who Should Get BI Tools First

Salespeople are the most important constituency for winning acceptance of BI across the company

IN BUSINESS INTELLIGENCE (BI), as in life, it's always a good idea to start at the top. Many of the CIOs interviewed for this article first rolled out dashboards and reporting and decision support tools to executives. The rationale? Get the top dogs on board and everyone else will have no choice but to follow. It's a fail-safe way to get people to adopt new technologies, and it worked effectively at Hillman Group. Jim Honerkamp, CIO of the \$380 million manufacturer, says once vice presidents, directors and managers at his company began getting phone calls from their CEO and CFO asking about information they were getting from their BI dashboards, they realized, "I'd better get my butt out there on the portal and start looking at these numbers because my boss is looking at them. It was that trickle-down that really started pulling people to the portal."

But CIOs can't unlock the full value and true potential of BI to transform businesses unless it gets to everybody in the organization. So once you've gotten executives to embrace BI, the next group of users to roll BI out to are salespeople. Because their job is to increase sales and because they're often compensated on their ability to do so, they'll be more likely to embrace any tool that will help them do just that—provided, of course, the tool is easy to use and they trust the information. Once you get them on board, you can use them to help get the rest of your organization on the BI bandwagon. They'll serve as your evangelists, gushing about the power of the tools and how BI is improving their lives.

—M.L.

impact on revenue that they can be the best advocates for transformative BI in the company (see "Who Should Get BI Tools First?" above).

But this kind of effortless link between information and processes doesn't happen by magic. Phillips says his company has been able to use BI effectively because IT and business users have worked closely and steadily in the past four years (the project began in 2001) to build up the company's BI capability and determine how Avnet's business units could support their operational management processes (such as taking orders, fulfilling orders and following up on quotes) with information from the data warehouse. IT, along with businesspeople, did business process mapping exercises to understand and flesh out the informal and formal aspects of standard operating procedures. "We needed to know how things really happen day to day, over and above the documented processes so that we could anticipate some of the business's information needs as we built out the warehouse," says Phillips.

One particular activity that IT sought to understand and make easier for salespeople

was their preparation for quarterly meetings with customers. When IT sat down with sales leaders to learn what went into the quarterly reviews, IT quickly realized that while the sales leaders traditionally created their reports individually, they all incorporated the same information (customer profitability, number of orders booked and billed, percentage of on-time deliveries and so on). So IT wrote a program that automatically populates a standard PowerPoint template that all salespeople now use to prepare for those quarterly business reviews. Because they no longer have to build the review from scratch, salespeople can meet with more customers each quarter. And they no longer have to hunt down the information themselves.

Now that the BI system matches up with the way the company conducts its business, it makes improving those processes and sharing the improvements that much easier, as was the case with the PowerPoint template and the quarterly reviews.

"This is not just about reporting," says Phillips. "It's about using BI to make us smarter."

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ACCESS TO ALL: QUAKER CHEMICAL

Quaker Chemical used its BI system to completely change the way it manages accounts receivable. In the past, the process of keeping track of whether customers paid their bills, and if they paid them on time, was primarily the purview of employees in the accounting department. Collection managers used the company's accounting system to identify which accounts were overdue, but they had limited information about the details of overdue balances. As a result, they had visibility only into glaring payment problems—customers who hadn't paid their bills at all in 60 days or more—and couldn't proactively identify which customers were at risk for not paying in full. Occasionally they'd ask a

tify which customers were consistently paying late and which customers weren't paying at all. The IT department programmed the data warehouse to automatically run reports on which customers still owed money to Quaker Chemical. The system would then send those reports directly to the sales manager in charge of those accounts several times a month so that they could follow up with those customers. Collections managers no longer have to manually keep tabs on this information.

Quaker Chemical hopes that by transforming the accounts receivable process, it will improve cash flow by getting customers to pay up sooner. At the end of the third quarter 2005, however, accounts receivable were

global company. Executives realized that to run their business globally, they needed to standardize specific business processes across the world, such as order to cash. To support the move, the company is in the process of replacing its 15 separate transaction systems with one ERP system. The single-instance strategy underscored the move to standardized processes—in fact, the new system demanded it. In the course of the project, IT met with business users to discuss their workflows and understand how transactions are processed inside the company. At that time, they also discussed how information from the company's BI systems could be incorporated into employees' workflows and business processes. The com-

“Because we changed organizationally, because the way our leadership was looking at the business changed, we were able to use BI to support our enterprisewide transformation.”

—IRVING “BUBBA” TYLER, CIO, QUAKER CHEMICAL

sales manager to get involved, but the whole process for identifying which customers weren't paying, why they weren't paying and putting salespeople on the case was ad hoc.

To improve accounts receivable, Quaker Chemical decided in early 2005 that salespeople needed to play a larger, more formal role in the collections process. After all, they were the ones who had the primary relationship with the customers and had opportunities to speak with them more often, more proactively and more sympathetically about their outstanding payments.

To get the salespeople involved, the IT department created a data mart that extracted accounts receivable information, historical payments and historical balances by customer and by transaction from transaction systems and loaded it into the data warehouse. By using its BI tools from SAS to analyze factors such as the amount of time it took Quaker Chemical to collect payment from a customer on a given invoice, and the number of times a customer paid part but not all of what he owed, the company was able to iden-

up from the same quarter a year ago, so the changes haven't quite taken root yet.

CIO Tyler says this business process change was successful in part because IT was careful to deliver only the most specific, relevant information in these reports to salespeople—things such as which customers were taking more time to pay their bills, which customers were paying portions of what they owed, and which customers had not remitted their payment in the allotted time frames—so that salespeople would know exactly what the problem was with each customer and how to follow up. “If you don't focus the information and deliver it intelligently, people won't understand how to incorporate it into their workflows,” says Tyler.

This kind of dramatic change in process needs to be linked to the overall business strategy, according to Tyler. “Information doesn't necessarily change anything. You have to have a strategy [to drive any change],” he says. The scope and scale of change would not have succeeded if Quaker Chemical had not decided in 2000 to stop operating regionally and reorganize as a

pany's strategic transformation marked the beginning of the new era of BI at Quaker Chemical. “Because we changed organizationally, because we changed our business objectives, because the way our leadership was looking at the business changed, we were able to use BI to support our enterprisewide transformation,” says Tyler.

SEIZE THE NEW BI OPPORTUNITY

Avnet and Quaker Chemical demonstrate that BI is about more than decision support. Due to improvements in the technology and the way CIOs are implementing it, BI now has the potential to transform organizations. CIOs like Avnet's Phillips and Quaker Chemical's Tyler who successfully use BI to improve business processes contribute to their organizations in more far-reaching ways than by implementing basic reporting tools. “Our BI system provides information that helps us seek out greater efficiency,” says Avnet's Phillips. **CIO**

Senior Writer Meridith Levinson can be reached at mlevinson@cio.com.

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VP Sales, West

Bob Melk • 415 975-2685

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Account Executive

Derek Jung • 415 975-2683

Fax • 415 543-2358

Senior Account Executive

Sara Mascall • 415 978-3385

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Devon Slattery • 415 975-2687

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Kevin Ebmeyer • 415 975-2684

LIST SERVICES

List Services Director

Kathryn A.W. Marston

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Jennell Hicks • 415 243-8585

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Danielle Tetreault

508 988-7969

Online Sales Associate

Ann Butera

CUSTOM PUBLISHING

VP of Program

Development, IDG

Charles Lee • 212 867-1229

VP, Integrated Media

and Online Sales

Jim Alla • 508 988-6763

Director

Mary Gregory • 508 988-6765

Executive Editor and

Director of Operations

Tom Field

Managing Editor

Jim Malone

Senior Project Manager

Amy Greenleaf

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John Danielowich, Jon Heinrich

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CIO CONTACT INFORMATION

Editorial, Advertising and Business

Offices: CXO Media Inc., 492 Old

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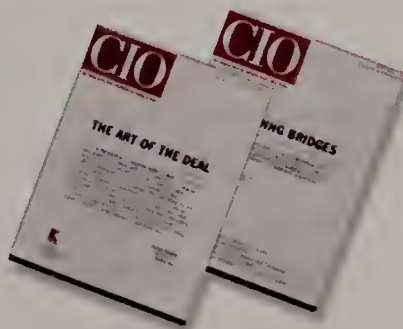
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Sailing the Seas of Spam

According to antispam vendor Postini, approximate number of spam e-mails delivered in the last 30 days: **3.65 billion**

Approximate volume of spam delivered in the last six months: **118 terabytes**

Number of times you could store the Library of Congress's printed collection with that much storage: **12**

Percentage of spam that is hosted within the United States: **31**

Approximate percentage of all e-mails that are spam: **67**

Approximate percentage of daily recommended sodium that two servings of Hormel Spam provides: **67**

According to the Anti-Phishing Working Group, number of new phishing e-mails reported in November and December 2003 combined: **90**

Total number of new phishing e-mails reported in September 2005: **13,562**

Number of brands hijacked by phishing in September 2005: **106**

Of the 106 brands hijacked, number of brands that comprise 80 percent of all phishing attacks: **6**

Country that hosts the most phishing websites: **United States**

During the last 18 months, total number of days when a country other than the United States hosted the most phishing attacks: **0**

Year in which the U.S. government began combating the illegal phishing problem: **2003**

Under 2004 law, years of prison term for phishing or "aggravated identity theft": **2**

Years of prison term if aggravated identity theft is terrorism-related: **5**

Year in which English government began combating the illegal fishing problem: **1379**

Under 1379 law, penalty for illegal fishing or piracy: **Death by hanging**

Under current law, penalty for illegal fishing or poaching: **Merely fines**

Notable member of England's Fishery Protection Squadron: **Horatio Nelson**

Food that Nelson's sailors ate while combating illegal fishing: **Salt pork**

Food that most resembles salt pork today: **Spam**



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